Scientific American.

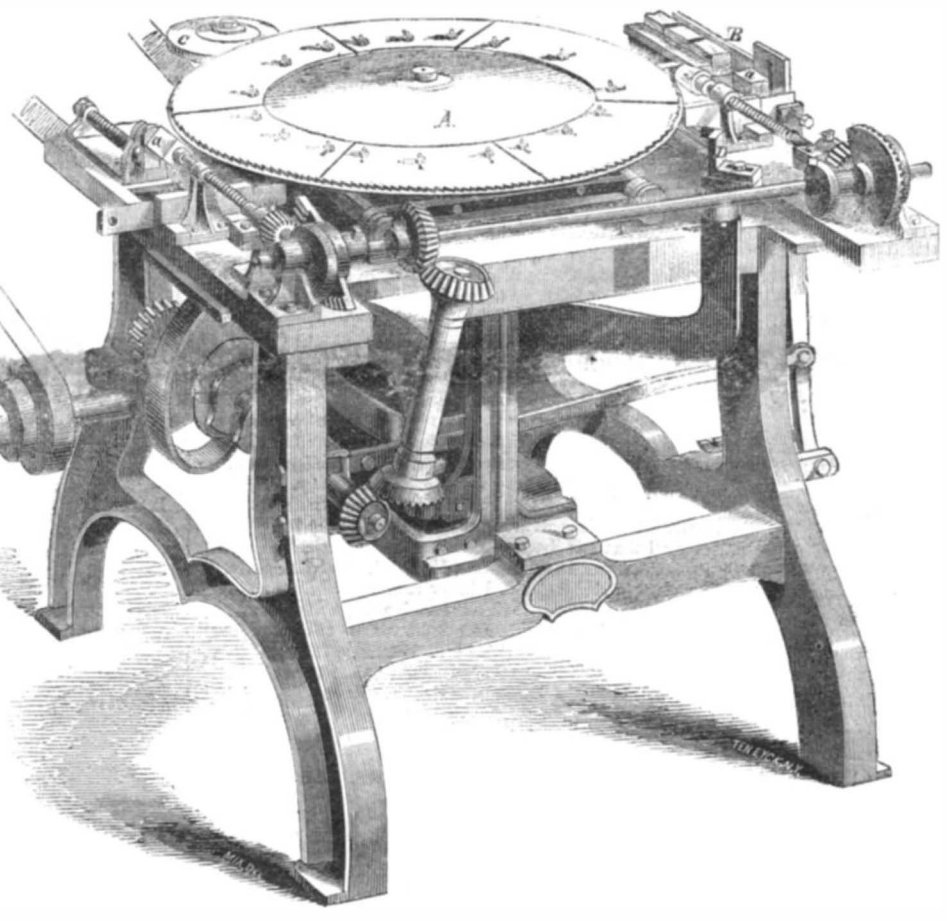
A JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, AGRICULTURE, CHEMISTRY, AND MANUFACTURES.

VOL. 1.—NO. 22. NEW YORK, NOVEMBER 26, 1859. NEW SERIES.

IMPROVED CORK-CUTTING MACHINE.

A vast amount of ingenuity and money has been expended in efforts to perfect a machine which would cut corks, such as are used for stopping bottles, phials, &c. It is said that one firm in Boston have paid out over $60,000 in this effort. Our engraving illustrates a machine in which the inventor thinks the long-sought end is achieved. We have seen it in operation, and certainly it cuts corks very handsomely and seems to be the very thing which has been so long desired.

A is a circular, revolving blade, with a very thin, sharp, smooth edge, having a thick circular saw, a little smaller than the blade, bolted in sections upon its upper side, so that the edge of the blade projects beyond the teeth of the saw. The blocks, *a a*, of cork to be cut are placed on each side of the blade which traverses back and forth, first cutting a cork on one side and then sliding along to cut a cork on the other side. The plane of the blade is inclined at a small angle with the axis of the cork in order to cut the latter tapering, and this angle may be varied to give any degree of taper required. The blocks of cork are held as in an ordinary lathe, and have a slow rotary motion while being cut. The blade may be raised and lowered at pleasure to adjust it to the cutting of different sized corks. The blocks are placed by hand in the wooden trough, B, and pushed along into the position occupied by *a*, when a fork with very short tines comes forward and, piercing the cork, draws it forward between the mandrels which immediately close upon it with a firm grip; all by automatic action from the machine. The blade is sharpened while in operation by means of the small grindstone, C, which grinds the lower side of the blade, and by the burnishing steel, D, which is brought, by the action of the machine, against the upper side of the blade at each revolution.



CONROY'S IMPROVED CORK-CUTTER.

As the thin edge of the blade cuts into the blocks of cork, the teeth of the superincumbent saw cut away the chip, and thus allow the blade to cut the cork smoothly and evenly entirely around. For cutting large bungs of wood for hogsheads and barrels, a saw about half an inch thick, much thicker than than the one shown in the cut, is substituted, and thus bungs may be cut from blocks as large as any which are ordinarily used for this purpose. The several motions described are produced by well-known mechanical devices.

This machine is the product of a series of inventions, secured through this office, by Edward Conroy, of Boston, Mass. (and 33 Gold-street, this city), whose last patent was granted Nov. 2, 1858. Persons desiring further information in relation to it may address the inventor at Boston. It has also been patented in Europe.

PURIFYING ILLUMINATING GAS.

There is a very great difference in the quality of the gases obtained from different kinds of what are called "hydro-carbons." Resin generates a gas composed of carbon and hydrogen, which requires no purifying; cannel coal also generates carbon and hydrogen gases, and generally some ammonia, which requires to be removed by purification. Most of the bituminous coal contains some sulphur and nitrogen, and by combining with equivalents of hydrogen in the coal, they produce both sulphureted hydrogen and ammonia. These must be removed before the gas can be burned. As the gas is conducted into a vessel containing water from the retort, a considerable amount of tar and ammonia are here condensed; still, some of it maintains its vapory condition. The next vessel through which the gas is conducted is a cooler, which resembles a tubular condenser of an engine, and consists of a bundle of small tubes, cooled with water on the outside while the gas passes through in the inside. This operation condenses all the tar and most of the ammonia, which are allowed to flow off into a receiver. In some works the gas is next allowed to pass into a cylinder filled with layers of coke, where it is subjected to a shower of water which condenses the whole of the ammonia. In other gas-works (and it was once the universal practice) the gas is conducted at once from the condenser to the lime purifier, two classes of which (wet and dry) are used. One consists of a vessel filled with milk of lime; the other contains lime, but slightly moistened and spread over an extensive surface. The lime absorbs any carbonic acid that may have been generated in the retort, also the sulphureted hydrogen gas, and sometimes a little ammonia and cyanogen. Water cannot condense sulphureted hydrogen, cyanogen or carbonic acid; but the lime has a chemical affinity for these gases, while it has none for the carbureted hydrogen—the gas which gives the light. It is thus that mechanical art and chemical science are combined to produce and purify our gas.

It has been found that some coals contain so much sulphur that it is very difficult to remove it entirely from the gas by the use of lime. The most efficient agent employed for this purpose, we believe, is the oxyd of iron, which was the subject of an English patent issued to Mr. Laming, of London, some years ago, and is now very generally used in that country. It completely absorbs the whole sulphureted hydrogen by mixing it with wet sawdust; and when it is fully saturated, it can be recovered and used over and over again by simply roasting it. From the London *Journal of Gas Lighting*, we learn that Mr. Laming has recently discovered a preparation of manganese somewhat superior to the oxyd of iron as a purifier. It consists of a precipitated protoxyd of manganese reduced to a fine condition and exposed to the air in a warm room, by which operation it absorbs about 50 per cent more of oxygen. It is mixed with an equal quantity of wet sawdust, and used in the same manner as has been described for oxyd of iron. Where cannel coal is employed for making gas, the oxyd of iron is not required for purifying and, indeed, very little lime is necessary; but in some of our cities, where the coals used contain a few pyrites, the foregoing information may be very useful.

AVERY'S RAILROAD JOINT.—We are informed that this plan of joining rails, which we illustrated last week, is now in course of trial on the Harlem Railroad; a few joints have been laid down near 61st-street (this city), and seem to work admirably. One of the incidental advantages of the plan is the avoidance of the jar which results from part of the bearings being wood and part iron, as all the bearings with this joint are of wood

AROMATIC CHEESE.—An American traveler, who recently visited Berne, thus expiates upon the peculiar perfume which pervades the air of that city:—"Did anything ever smell so bad as Swiss cheese? You can imagine the delights of a residence in Berne, when I tell you that Berne is one great warehouse of Swiss cheese—that it is pervaded by the smell of cheese—that the fresh air of your morning walks, and the still atmosphere of your room, and the dignified enjoyment of your dinner, are all spoiled by the odor of cheese. Cheese is the Bernese otto of roses."

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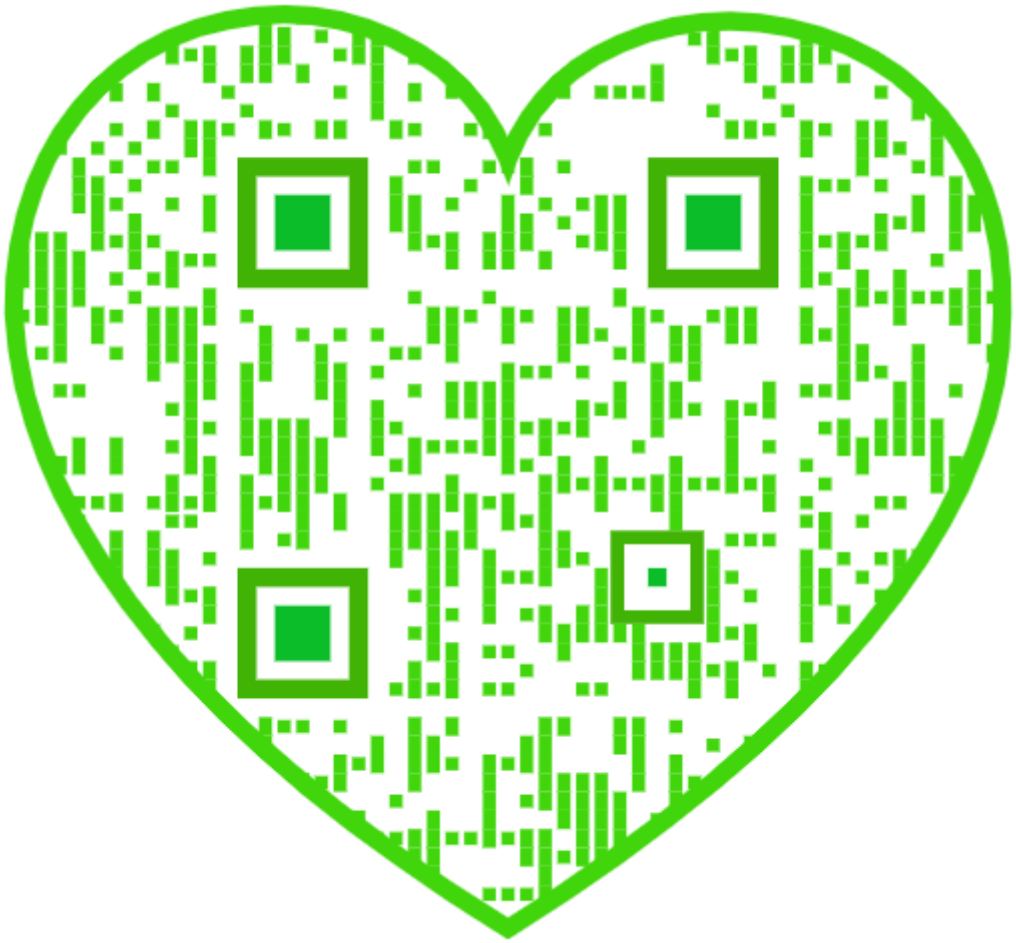

LIQUEFACTION OF FLINT IN WATER.

MESSRS. EDITORS:—Some twenty years ago, the community witnessed a remarkable discrepancy between theory and practice, in the discovery that "some things could be done" which "the books" of that time declared could not readily be accomplished with two of the most important substances on our globe—coal and iron. It was alleged, in some of the text-books of the time, that anthracite, with all its good qualities, was valueless for fusing iron. Yet you remember the revolution which was then suddenly effected by the fact that the alleged impossibility had been overcome in the simplest manner, through the tact of an humble artisan. The event was celebrated by a Pennsylvania festival, with Nicholas Biddle as the orator; the discovery being considered of national importance, especially valuable among the anthracite and iron mountains of that commonwealth. And how was the miracle accomplished? Like the operations of Nature herself, by simple and economical means. The substitution of a *hot* blast for a *cold* blast accomplished results in this matter, which confounded the wisdom of the schools—conferring upon mankind benefits which can be but feebly calculated in dollar-like millions.

And now for a more recent development—between which and the above-mentioned case there is some analogy—at least as far as thermal influences are concerned; superheated steam contributing to effect, in this latter case, results successful and wonderful as those flowing from the hot blast in fusing iron. Having watched the progress of this recent development—having considered its influence for various practical purposes, as well as in its connection with natural phenomena, I now respectfully address the SCIENTIFIC AMERICAN in regard to it, as one of those achievements which will render this year memorable in the annals of science and art.

I allude to the *liquefaction of quartz rock*, by a new process—the solution of silex "in excess," in water—to an extent and with a cheapness unparalleled, and in a manner radically different from the expensive alkaline mode in which it was said that quartz could only be liquified; effecting in this matter a revolution that will be more remarkable in its manifold applications than the wonderful discovery by which the iron and coal mountains were warmed into sympathetic alliance.

Such a man as my ancient friend, Professor Dewey, of the Rochester University, whose life is largely devoted to the "literature of the rocks," to the structure and history of the foundations of our globe—who studies these revelations, Hugh Miller-like, with the enthusiasm of a devotee at the shrine of a favorite saint—may appreciate, with you, the feelings with which this letter is addressed to him in common with you, about the success of an enterprise that signally illustrates the philosophy of nature, while furnishing fresh stimulus to scientific research, and new material for commercial, artistic and manufacturing purposes. I refer to Professor Dewey particularly on these subjects, in common with the SCIENTIFIC AMERICAN, under the consciousness that no man in the land can more readily perceive, as no one is more firm in resisting, fallacies connected with his favorite sciences, than the venerable professor of geology and chemistry in the Rochester University. Such men, too, as those eminent personages in Philadelphia, including a distinguished ex-president of the Girard College, who have watched the progress of this development, as I have, with immense interest, feel naturally a corresponding satisfaction in the realization—not merely of the *discovery*, for of that we have been long satisfied—but of the capacity of the plan for supplying the products in large quantities, commensurate with the anticipated wants of commerce for various uses of the community.

The Geysers of Iceland, some of the thermal springs of America, and other geological phenomena exemplify alike the natural liquefaction of quartz and its subsequent re-conversion to rock; furnishing lessons not unconnected with the success which has now crowned this branch of the labors of Benjamin Hardinge, whose process has liquified a tun of quartz, and can liquify two tuns, in the present digester, with a capacity in that single machine to liquify six tuns of quartz per day, with a degree of speed and economy which illustrate the discovery as one of the memorable events of the age.

Important everywhere among civilized nations, this recent development is peculiarly interesting in connection with the auriferous regions of America, Australia, and other lands. How shall we estimate the value of a cheap and ready process for the perfect solution of gold quartz and sand in water?—enabling the miner to precipitate the precious metal without amalgam, at comparatively trifling expense, while simultaneously producing a silicious liquid for casting conglomerate and other building materials in almost any required form and color, as well as forming a *base* for the reproduction of minerals of the most beautiful hues.

Without dwelling on the extent to which Mr. Hardinge's views were stimulated by the operations of those humid volcanoes—safety-valves for the thermal operations of nature's great geological laboratory, and without discussing his views concerning the origin of rocks, from the first gaseous elements, through the fluid, semi-solid and solid conditions, down to the tertiary period where Hugh Miller began his "Testimony of the Rocks," I take pleasure in quoting the remarks of Professor Fleury, an estimable practical chemist and geologist, who has had ample opportunity for witnessing the successful development of this mode of liquifying the quartz rock, and who has earnestly scrutinized the agencies whereby Mr. Hardinge obtains his great synthetical base, some of which agencies are represented to be alike cheap and important, in aiding the solution and in facilitating the subsequent combining process. Under date of Nov. 1st, Professor Fleury remarks:—

"I was honored with an invitation to visit the works of Professor Hardinge, at 104th-street and Broadway, New York, near his residence at Woodlawn, and *saw him dissolve one tun of quartz at a time*, in a single digester, containing about one thousand gallons of water. The digester holds *over three thousand gallons*, and is capable of discharging six thousand gallons of 'liquid flint' every day. The liquid quartz which I saw dissolved is chemically pure, and the solution *perfect;* the liquid forming a *thick pellicle* when heated and exposed to the air, although it may be preserved any length of time in close reservoirs in the same liquid state. My attention was drawn towards Professor Hardinge about two years ago, by an article on this subject, occupying over four columns of the *New York Tribune*, and signed by a number of eminent European chemists. Professor Hardinge has been for many years laboring to perfect his vast purposes; and I hereby stake my reputation, as a man claiming some scientific knowledge, to judge of the fact, that he is now ready *to build a city of the most durable as well as most beautiful stone which it is possible for the human mind to conceive*; walls of variegated conglomerate, lined with colored porcelain (painted in fresco), fire-proof roofs, *molded* statuary of the richest and hardest kind, with the aforesaid liquid flint *as a base*. Since the above-mentioned publication, and my consequent personal acquaintance with Professor Hardinge, he has been industriously engaged in overcoming the great difficulty of separating gold and silver from *quartzose pyrites*. His success in this department will soon be known in the commercial world. Having taken pains to keep fully posted on all that has been discovered and practically done in this department, in France, England, and Germany, as well as in this country, I know that never before has such a perfect solution of silica on such a large scale been presented to the scientific and industrial world; and I can vouch for the fact, that Mr. Hardinge has exhibited *liquid* flint with silica in far greater excess over any *solvent base* than has ever before been achieved by the ablest chemist, either in Europe or in this country. This fact has been tested by several European celebrities, whose certificates I have seen, given by them after examining samples of the article, which is now exhibited in such large quantities."

Asking you to peruse the enclosed statement of Professor Fleury, concerning some of the many practical uses to which the production of this liquid flint is applicable, I respectfully refer you, now, to specimens of the liquid rock thus flowing from Professor Hardinge's operations—a thousand gallons liquified in a single vessel, by a quick and cheap formula—as a practical illustration of an event interesting alike to the scientific world and and the community generally.

HENRY O'RIELLY.

New York, Nov. 17, 1859.

USES OF LIQUIFIED QUARTZ.

Professor A. G. Fleury, having recently witnessed the liquefaction of quartz rock by Dr. B. Hardinge's process, thus enumerates some of the purposes to which the discovery may be applied in the arts of the builder, the sculptor and the jeweler:—

The question may be asked "What has been Mr. Hardinge's object in getting a digester of such enormous caliber as to weigh, with its appendages, nine tuns? One great object, as will be seen, is to dissolve *two tuns* of quartz regularly in water at a time, thus treating six tuns every day in a single digester, showing how to secure every particle of gold in auriferous quartz, be it fifty dollars to the tun or a thousand. Whoever examines his process will find that not a particle of the precious metal can get away. There is neither washing nor amalgam, and the solution of this quantity of quartz in water would give 6,000 gallons of liquor of flint per day from a single digester, with the silex in far greater excess than has ever been achieved before.

The next question arises: "What is to be done with 6,000 gallons of liquid flint daily from a single digester?" I answer, that presses of quick delivery can be erected along the Hudson, or elsewhere, under banks of silicious sand and conglomerate, where tens of thousands of tuns can be rapdly molded into beautiful and durable building stone; the silicic acid being saturated, during the process of solution, with a *base* in conformity with a similar law which spontaneously molded the conglomerate pillars in the capitol at Washington, costing the nation so much money. Common sand may be molded into building blocks through the agency of this base, which will not disintegrate by the action of the weather.

Mr. Hardinge is in correspondence with his Imperial Highness, Prince Jerome Bonaparte, with reference to the immediate adoption of his process in molding the silicious sand in Egypt for the locks and canal of Suez, so as to diminish the vast expense to at least one-half the cost of quarrying and hauling the granite from distant mountains.

The most beautiful building stone, where palatial grandeur is the aim and object, can be made by an admixture of quartzose rock, broken in small pieces, combined with white pebbles from the shores of Long Island, molded as above, faced and polished with the flint-varnish, prepared in such a way as to be impervious to the action of the weather. Such conglomerate stone, interspersed with silvery, shining scales of mica, together with the variegations caused by a variety of mineral oxyds in the angular pieces, in contradistinction from the white, semi-translucent pebbles, would form the richest conglomerate that the mind could conceive Tens of thousands of gallons of this liquid flint, combined with substances having syathetical affinity, will be used for inside walls, plain and in fresco; also in stucco ornaments and in molded marble, chalcedony, &c. Every variety of rock can be reproduced, richly and cheaply variegated at pleasure by mineral oxyds. Vast quantities will also be shortly called for, to saturate thousands of those drab sandstone houses which are being built in this and other cities; because this peculiarly open, granular stone is liable to fill with water in a winter's rain, and suddenly freeze and chip off.

It would be too voluminous to mention, here, the many applications of this material; suffice it to say, the result of many long years of the experience of Mr. Hardinge may now be looked for, not only for the gratification of his friends, but to set forever at rest all doubt on the part of the public at large.

ELECTRO-MAGNETISM AND LOCOMOTIVES.

MESSRS. EDITORS.—In an article on "Magnetism applied to Locomotive Driving-wheels," in your issue of Oct. 29th, it is quoted from the London *Engineer*, to the effect that locomotives, as now constructed, have proportionally more weight and consequent adhesive force than power. This may apply to the English locomotive which is much heavier than the American in proportion to its power, as proved by the recent trials in Egpyt and Chili. American locomotives usually have sufficient strength to slip or revolve their drivers when the load is so great that they cannot move forward upon the track. To illustrate this, attach the engine to a train just heavy enough to balance the power of the engine, and when the power is fully exerted no forward movement takes place; the driving-wheels merely revolve. Now, if cogs could be supplied to these wheels, would not the engine and train start at once and go ahead, with more or less rapidity, dependent upon the power of the locomotive to revolve its driving-wheels? Electro-magnets appear to impart such a tractive power; it is not due to the weight of the engine, and may be used advantageously.

J. H. N.

White River Junction, Vt., Nov. 23, 1859.

JAPAN TRADE.—A vessel arrived lately at Puget Sound, from Japan, with a small cargo of Japanese goods, and was about to load with lumber for Japan. The people of Washington Territory were elated with the hope of a new, near and excellent market for lumber.

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MR. DONALD McKAY'S OPINIONS OF BRITISH SHIPPING.

[From the Boston Traveler, Nov. 8,]

Mr. Donald McKay, who, at last accounts, was making a tour of inspection through the British shipbuilding yards, has sent several letters to his friends in Boston containing his views of what he had seen. From these letters we have been permitted to make extracts that may be of interest to our shipbuilders and others interested in commerce and navigation:—

"During my stay in Liverpool, I visited Mr. Laird's ship-yard at Birkenhead, in which 2,000 men are employed. Mr. Laird has three large paddle-wheel steamers of iron on the stocks, designed to run between Holyhead and Dublin, two tow-boats for the Ganges, and several barges of large dimensions for the same destination, a steamer for South America, nearly completed, and a steamer to run on the river Amazon, already launched. In addition to these he is repairing one of the large Canadian screw steamers. The Holyhead and Dublin boats, alluded to above, are just begun, and are unlike our American boats, inasmuch as they have very sharp midship sections, while their ends are not as sharp as those of the Sound steamers. They are over 300 feet long, and, according to contract, must perform eighteen knots. The steamers for the Ganges are over 200 feet long, very wide and shallow, and intended to draw only two feet water. Their engines and wheels are supported by large hog-frames and bulkheads. The barges are smaller, but resemble the steamers in model, and all are built of steel, the plates not more than one-eighth of an inch in thickness. Iron and steel are the principal materials used here in shipbuilding; and, as experience has proved that they are more economical than timber in the long run, it is high time our shipbuilding merchants turned their attention to this subject. We have iron and coals enough, and plenty of mechanical genius, to enable us in a few years not only to overtake England in this department of the mechanic arts, but to pass her."

The steamer *Voyageur de la Mer*, as our readers are aware, was designed, modeled and built by A. Stone, Esq., of this city, for the Viceroy of Egypt, at a cost of over $500,000 and was considered a very superior vessel. She is now in Liverpool. Mr. McKay says: "My time was so limited that I was unable to look at this vessel, that lay in a graving dock adjoining the Brunswick dock. As far as I could learn, her engines have been taken out, and she will be cut in two and lengthened seventy-two feet in the middle. There is the pride of Boston in the mud." Mr. McKay must be well aware that she was built agreeably to the design of Mr. Stone, who professes to be a "practical mechanic," and that the workmanship was well done. The fact that she is about to be lengthened only shows a change of taste in her owner, and does not reflect injuriously upon the work of those who built her. Mr. McKay continues:—

"The *Donegal*, of 101 guns, is at anchor in the Mersey. She is of a very full and clumsy model, and does not seem capable of going more than four knots with steam and sail combined. The man who designed her appears to have derived his ideas of naval architecture from a Dutch galliot. Her model is a disgrace to the Board of Admiralty that sanctioned it.

"Although I designed and built the clipper ship *Lightning*, and therefore ought to be the last to praise her, yet such has been her performance since Englishmen have learned to sail her, that I must confess I feel proud of her. You are aware that she was so sharp and concave forward that one of her stupid captains, who did not comprehend the principle upon which she was built, persuaded her owners to fill in the hollow of her bows. They did so, and according to their Bullish bluff notions, she was not only better for the addition, but would sail faster, and wrote me to that effect. Well, the next passage to Melbourne, Australia, she washed the encumbrance away on one side, and when she returned to Liverpool the other side was also cleared away. Since then she has been running as I modeled her, and is this day considered the swiftest sailing vessel under the British flag. Such is her stability that her owners are having her poop extended forward to form a third deck in connection with the house amidships and the top-gallant forecastle. She is as sound as when built, and as true in outline. As a specimen of speed, I may say that I saw recorded in her log (of 24 hours) 436 nautical miles, a trifle over 18 knots per hour. She is a great favorite with passengers, and is the pet of her owners.

"The great steam ram is designed to be a shot-proof floating battery, built and fashioned at the ends to destroy any vessel against which she may be propelled. Her strength and speed, therefore, are great, or, are intended to be great. She has no external keel, but is rather sharp on the bottom. The famous iron steamers *Himalaya*, *Delta*, and *Immaculate Conception* (yacht for the Pope) have been built here; also a steamer for the Sardinian government, and several gunboats for the royal navy. I have examined the plans of all these, and their chief characteristics are rising floors, vertical sides above water, very sharp bows slightly concave, with a modernized beak-head, by which they obtain a little more space than usual in the cutwater.

"The East India docks are almost all filled with merchantmen, many of them of the strangest models I ever saw. The *Alhambra*, which you know is the fullest ship I ever built, would look like a clipper alongside of them—they are so bluff and clumsy about the bows, and have tremendously high sterns, lumbered with quarter galleries. Broadside on, their sheer was made up of crooked lines—that is, high opposite the channels, where the strain of the rigging had hauled up the planking; between them were hollows like the waves of the sea, and their ends droop like the head and tail of a disgraced dog. Their models must have been made a hundred and fifty years ago, for there is nothing like them in any of the yards that I have visited.

"Mr. Green is building an East Indiaman upon his own account. She is rather a pretty model, but is too bluff or rounded in the bow, though her bottom is quite sharp. English naval architects do not seem to have as yet discovered the advantages of full bottoms and sharp ends for sailing vessels. This ship has two sternposts, and is otherwise so constructed aft that, if desired, she can easily be adapted for the reception of a propeller. No expense will be spared to make her a first-class vessel, according to English notions, but she is not nearly so heavily timbered as one of our vessels of like capacity. Her keel is only nineteen inches square, side and bilge keelsons twelve inches square, ceiling from four to five inches thick, even on the bilge and outside planking five inches. Her beams are all of iron, resting upon stout clamps, but their fastenings to the sides and the knees connected with them are very light. On the top of the beams is an iron stringer bolted to the sides, and two other iron stringers at about one-fourth the breadth of beam, and the deck plank over all. She is diagonally strapped outside of the frames, the braces not crossed, but ten feet apart; yet this ship is classed at Lloyds' for thirteen years A 1; while an American ship, built of better material, and twice as heavily fastened, finds it difficult to obtain a place upon the first figures for half the term. I shall endeavor to call the attention of Lloyds' surveyor to the condition of our ships, compared with the best built on the Thames.

"I have visited Deptford, Woolwich and Chatham dockyards; and in all of them great activity prevails. At Chatham I inspected the *Ariadne* of 26 guns. Like our sloops-of-war, she has a clear spar deck for working ship, excepting two heavy guns, one forward and the other aft. Her standing rigging is of wire, which, I was informed, would soon supersede rope for that purpose in the navy. The *Irresistible*, one of the eighties designed by Sir William Symonds, is in process of conversion to a screw steamer; a frigate of fifty guns was cut in two, having her length increased and ends sharpened, preparatory to receiving steam power; a new screw frigate of fifty guns was ready for launching; the keel of another had just been laid; a ship of 91 guns, and several corvettes and gunboats were also being built. The scantling of all these vessels is very light, compared with that used in our navy yards, and I have no hesitation in asserting that our models for speed are very superior to any that I have yet seen in the royal dockyards."

GEESE PICKED BY MACHINERY.—The *Scientific American* announces a machine for picking geese, the result of a number of years of labor, and one of the most ingenious pieces of mechanism ever seen. It not only plucks the feathers, but separates the long ones from the short ones, and cleans them perfectly while passing through the machine. It will pick forty-five geese per hour, and must materially affect the price of feathers.

[We copy the above announcement from the London *Family Herald*, and advise the editor not to show himself in this country, unless he desires to feel the personal working of this "goose-picker."

TEMPERING STEEL WIRE.

MESSRS. EDITORS:—Among your "Notes on Foreign Inventions," on page 254 of the present volume of the SCIENTIFIC AMERICAN, I observed that a patent had been obtained in England by T. F. Cocker, of Sheffield, for tempering steel wire by immersing it when taken from the annealing-furnace in hot water, warm oil, or any liquid in a heated state. As this process has been familiar to me for a number of years, I may state to you what first induced me to try it. About seven years ago, at the establishment of Todd & Rafferty, of this city (then Todd, McKay & Co.), we had a number of large taps to temper; and as a considerable amount of labor had been expended upon these, I was afraid lest any of them should crack in the hardening (which frequently will occur, although much caution may be exercised), so I resolved to plunge them, when red-hot, in warm oil. The temper obtained was excellent, and the taps are in use to this day. Previous to this time, I had experimented a little in the tempering of steel by this means. My object in these experiments was to ascertain whether, by using oil at a certain temperature, a certain temper to the steel could be at once obtained, instead of first hardening and afterwards annealing it. In these experiments, I took a piece of small steel wire about 9 or 10 inches long, heated it to a dull red, plunged it in cold water, and then annealed in a metallic bath, so as to fetch it to a purple. This piece of wire I secured at the one end, placed a weight on the other, and marked its deflection. Another piece from the same coil of wire I heated in the same way, and plunged it in oil heated to 160°. This piece of wire I applied to the same test as the first; but found that it did not deflect so much as the other. With the oil at 180°, I tried again; but it did not yet reach the mark. Another 20° to the heat of the oil, however, fetched it right. From this simple experiment, the conclusion was come to, that any temper can be readily obtained by the simple immersion of the red-hot steel into oil previously heated to a suitable temperature. Thus, for a straw color, the oil ought to be heated to 175°; a brownish yellow, 190°; for a purple, 200°; for a blue, 212°. In tempering costly taps, dies, cutters for gear-cutting engines or steel wire in the coil, this method does very well, as its safety and equable results can be relied on. H. A.

Paterson, N. J., Nov. 21, 1859.

[We are much obliged to our correspondent for this clear and explicit letter regarding his experiments in tempering steel by a single operation. The information is very useful to a large class of our readers.—EDS.

COMPRESSED AIR-ENGINES.

MESSRS. EDITORS:—The article published on page 289 of the present volume of the SCIENTIFIC AMERICAN, under the head of "Air-engines," overlooks facts and circumstances in which I have an interest, and which I desire to make public through the same medium. About the year 1835, I expended some $300 in putting an air-engine into operation, on a small scale, which worked well; but I found no person willing to furnish money to carry my design into effect, and not having the means myself, was compelled to lay it by.

I have filed several caveats with the Patent Office, in relation to this subject; and in the year 1836 I forwarded a caveat to England, to be filed in the Patent Office through the firm of Messrs. Godfrey & Walsh, merchants of this city, who at that time were doing business with England. It is quite probable that the Glasgow man has taken his ideas from mine, as stated. I should be very glad to assist any person so disposed, to carry the plan into effect, and upon reasonable terms. I know it has long been said that you could not force the atmosphere through a pipe two miles long, but I am of the confident opinion that I can show a sufficient reason why they did not. MELLEN BATTEL.

Albany, N. Y., Nov. 14, 1859.

CIDER IN CHUNKS.—The Bordens who solidify milk up in Litchfield county, Conn., have also succeeded in solidifying sweet cider, so that five quarts are reduced to one which becomes a jellyish substance, and can always be made sweet and liquid cider again by adding water.

[Those who love the good old-fashioned beverage will thus be enabled to carry their cider around with them in solid chunks, as many do the plug leaf. The editor of the *Winsted Herald* (who ought to know) seems to like the article.

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WORK OF WATER-WHEELS BY NIGHT AND DAY.

This subject continues to attract the attention of our readers. A correspondent, H. M. S, of Providence, R. I., sends us a communication in regard to the matter, to which, in accordance with our practice, we shall reply. The writer reiterates the idea of a previous correspondent, J. W. K., that, "what has been so universally observed and spoken of for ages is likely to have some foundation in truth," and objects to our comparison of the wide belief in absurd superstitions, because they were not *observed*. In reply to this we ask *how* has the speed of water-wheels been observed, to show that they run faster in the night than in the day? Simply by the eye, in the loosest possible manner, without measuring either the varying head of the water, or the velocity of the wheel. More important still, they were mostly made by men with minds prejudiced in favor of one side—men who had come to their conclusion before they commenced their investigations. Now, a million of such observations made in precisely the same way in which those spoken of by our correspondent have been made, would have less weight on our minds than one single test conducted with the aid of watches and measuring-rods, in the careful, and thorough, and common-sense manner in which those were conducted by our Pepperell correspondent.

In regard to another of our comparisons, H. M. S. remarks, "Even the theory that the changes of the moon produce a change in the weather has some foundation in truth. Weather tables and lunar phases for nearly 100 years show 491 new or full moons attended by a change in the weather, and 509 without." How these facts show that changes of the moon produce any effect on the weather we do not understand. In order to come to any conclusion on the subject, we should require to know how many changes of the weather occurred between the changes of the moon. The weather is not precisely the same any two hours in the day. What was called a change in the weather? And how much time was allowed before and after the precise moment of the moon's change for a change in the weather to be considered as accompanying it? This is one of those departments of investigation in which sound judgment is required in drawing inferences from the facts. We have great faith in Herschel.

Our correspondent contends, further, that the flow of water through the wheel must be greater at night than in the day, because the pressure of the air is greater upon the water at night than in the day. If the pressure of the air were greater at night, it would obstruct the flow of the water quite as much as it would tend to increase it; indeed, theoretically, a little more, for the increase of pressure near the earth would exceed the increase at a greater altitude.

In the Providence Athenæum H. M. S. will find Bacon's *Novum Organum Scientarium*, and if he will read that immortal work he will see the comparative estimate which the greatest intellect the world has ever known placed upon facts and upon speculations. And if he is famililiar with the history of scientific research during the 239 years which have elapsed since the publication of Bacon's treatise, he knows that the spirit of that work has been constantly spreading more widely and deeply, and that it is most fully and heartily received by the greatest masters of science in every department of inquiry. Theories are rejected, not "because we can give no philosophical reason why they should be adopted," but simply because they are not in accordance with the facts.

We take this occasion to thank L. W. B., our Pepperell correspondent, for communicating to us the account of his interesting experiments. We have no doubt that most of our readers appreciate the value of rational and careful observations in leading to sound conclusions.

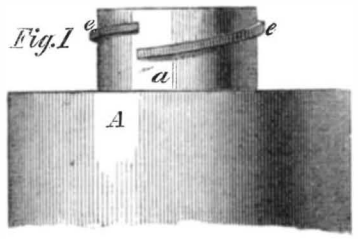
CLEANING BOILERS.

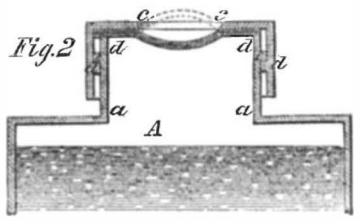
A correspondent of the London *Artisan*, an engineer on board the British steam gun-boat, *Benares* at Calcutta, describes a simple method by which he removed thick encrustations from the high pressure tubular boiler on that vessel. He says: "Having had occasion to boil some lemon grass in a cast iron kettle, I was astonished when pouring out the water to find the metal perfectly clean, and a thick sediment removed which had been attached to its inner surface. I subsequently tried the effect of the same material on the boiler of the *Benares*, and found that it produced the same beneficial effect, and I had only to renew the grass once in two weeks to keep the boiler clean."

To prevent the grass choking the cocks, he placed it in a metal box of about one-and-a-half cubic feet in size. He also found that this grass was equally effective in removing the scales formed from fresh as that formed by salt water. The notice of this case may be very useful to our marine engineers. It appears to us that almost every vegetable substance can be used advantageously in preventing and removing scales in boilers. We have known potatoes, indian meal, sawdust of various kinds, blocks of oak, slippery elm bark, hay, and molasses employed with good effect for this purpose. The objection to the use of such substances is their liability to cause "priming" in the boiler; but if managed with care this may be prevented.

IMPROVED PRESERVE CAN.

This simple invention, for which Letters Patent were granted to William Fridley and Frederick Cornman, of Carlisle, Pa., October 25, 1859, will require no long description in order to be understood.





A is the fruit can and *a a* its neck. Two projections, *e e*, are soldered spirally around the neck, and two lugs, *d d*, are fastened on the inside of the cover in such a manner that they may catch under the spiral projections and thus the cover may be screwed tightly upon the can. A hole, C, is made in the top of the cover, and a piece of india-rubber is placed entirely over the inside of the top of the cover, so that that may interpose between the top of the neck and the cover, when the latter is screwed down, packing the can air-tight. The cover is screwed to its place before the contents of the can become entirely cool, and when the volume of these is reduced by continued cooling, the partial vacuum causes a depression in the india-rubber portion of the top of the cover, as represented by the black line in Fig. 2. Should decomposition take place in the contents of the can, the gases thence resulting would force up the india-rubber, causing it to present the convex form shown by the dotted lines in Fig. 2. Thus, the appearance of the india-rubber disk is a sure indication of the condition, perfect or damaged, of the contents of the can.

Any further information in relation to this invention may be obtained by addressing William Fridley or Samuel C. Huyett, to whom the patent has been assigned, at Carlisle, Pa.

A GOOD-NATURED LETTER.

Good nature is the lubricator of the wheels of social life. Lord Palmerston said recently, in an address to the graduates of an English university, that the way to succeed in life is to meet all trials and disappointments and annoyances with resolute *good nature*. Compare the state of mind of the writer of the following letter with that of one of your querulous and complaining individuals, who are such nuisances to themselves and to all who come in contact with them. How surely he may look forward to a cheerful, prosperous and contented life, and to a green and happy old age!

MESSRS. EDITORS:—Permit me to inquire whether O. H. K. (see "Notes and Queries," in No. 18 of the present volume of the SCIENTIFIC AMERICAN) would not fare better, in trying to evaporate at a greater heat than 212° Fah., by employing steam-tubing, inclosed in an air-tight box, and conveying the cold air into the under side of the box? On its being heated, it would escape by an opening at the top, and could be conducted wherever he wants it, to give heat for whatever purpose he requires. The temperature would easily be regulated by the pressure of the steam in the boiler generating it, and could be momentarily altered at option by applying weights to a regulating-valve.

I began to read your paper, considering it a necessary guide for persons employed in mechanical and in general manufacturing business; but I found it to contain, besides dry information and facts (which are presented in the most attractive form), such edifying and entertaining matter that I prize it as my most valuable and interesting source of enjoyment and information. I think that knowledge-seeking individuals, in all classes of our population, would read its contents with avidity; but, as yet, I have never found myself in contact with persons desiring to be posted-up about all the new additions to our stock of facts in sciences and arts; and, from this cause, I have not yet been able to procure you an addition to your subscription list. Your paper tells things not to be found in books; it contains *everything new and interesting* in manufactures, arts and sciences. I think it might be called (if the "new series" is continued as it has been begun) the "Speaking-tube of American Genius," by which it sounds out its progress into all parts of its domain. Therefore it is especially adapted to the use of persons beginning to ascend the hill of business-life, as it will enable them to look over, at a glance, all movements in the field of invention and discovery. G. M.

New York, Nov. 22, 1859.

OUR JOURNAL IN EUROPE.

The circulation of the SCIENTIFIC AMERICAN is steadily increasing in Europe, and especially in Great Britain, where it has a large number of readers. We have before us several letters from our subscribers abroad, from which we make the following extracts:—

MESSRS. EDITORS:—It is now six years since we first introduced your valuable publication into the libraries of our Polytechnic Institution and Polytechnic Association. From that time your issues regularly arrived by the bookseller's parcel; but it is now some months since this way seemed to be stopped, and therefore we were obliged to have recurrence to direct subscription, for the SCIENTIFIC AMERICAN is, according to the general opinion of our technical public, and our own private persuasion, indispensable for every man who wishes not to be behind his age. So you will find our name among the list of your *direct* subscribers since the opening of the "new series." We are the proprietors of an extensive shop for agricultural machinery, and editors of an agricultural journal, *The Plow;* we beg to hand you some copies of that periodical by this present post. Now, as it must be of interest to American inventors to see their inventions described, and these descriptions circulated as much as possible, also, on this side of the globe, we beg to request you to inform your readers that we are ready and shall feel pleased to publish, without any charge whatever, such communications (accompanied by stereotype casts of blocks, catalogues, prize lists, &c.) as may be sent to our address, postage pre-paid, of course.

J. PINTUS & Co.

Berlin, Prussia, Sept. 28, 1859.

In a recent letter from the proprietor of extensive mills at Carlisle, England, he says:—"I have, for a long time, been a regular reader of your invaluable weekly paper. I get the *Engineer* (London) and other similar papers here; but none of them are half so practical as yours."

An old subscriber, residing at Saverne, France, writes:—"Allow me to offer you my congratulations and my thanks for all you do for your readers. I am a subscriber to French, German and English journals, of similar class; but the SCIENTIFIC AMERICAN is the most complete, most practical, and the cheapest. The others cannot be compared to it. I am very sorry that nobody in my neighborhood understands English, or I would be able to send you some new subscribers. I wrote to my bookseller plainly that I would agree to pay *again* for my paper; feeling it to be very generous of you to give your subscribers, without any extra charge, a journal so greatly enlarged and improved as is the first volume of your 'new series.'"

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PERPETUAL MOTION.—PATHETIC STORY OF ITS INVENTOR.

About six years ago we published the first description of a machine invented by Mr. James G. Hendrickson, of Freehold, N. J., "to go of itself." A model, which Mr. Hendrickson had made after patient whittling for 40 years, was brought into our office, and we found that it would go without any impulse from without, and would not stop unless it was blocked. The power was self-contained and self-adjusted, and gave a sufficient force to carry ordinary clock-work without any winding up or replenishing. In short, we saw no reason why it would not go until it was worn out. Our announcement of the fact brought out a great deal of ridicule, the incredulous pointed at all of the projects to obtain a perpetual motive power which had failed in the past, and although they could not dispute the fact that it was "going," they nearly all attributed the movement to some hidden spring or ingenious trickery. The inventor was an old man, who had spent his whole life in pursuit of the object he had now attained. He had become so much accustomed to ridicule that he was very patient under it; and the only reply he made to the cavilers who pronounced the thing impossible, was: "But it *does* go." The notice which we printed attracted the attention of the curious, and for the first time in his history, the inventor found a profit in his handiwork. He was invited to be present at various fairs and exhibitions of new inventions, and wherever he went, his machine formed one of the chief attractions. Science, however, turned up its nose at him, and determined to put him down. The professors were all against him, and as they had pronounced the whole thing a humbug, they were determined to prove the truth of their assertion. Accordingly, Mr. Hendrickson was seized at Keyport, N. J., for practicing "jugglery," under the "Act for Suppressing Vice and Immorality." At the trial, several builders, mill-wrights, engineers and philosophers were called, who testified positively that no such motive power as that alleged could drive the machine, and that there must be some concealed spring within the wooden cylinder. There was no help for it, and the imposture must be exploded. An ax was brought, and the cylinder splintered into fragments. Alas! for the philosophers, there was no concealed spring, and the machine *had* "gone of itself." But alas! also, for poor Hendrickson, the machine would go no more. With trembling hands he again resumed his spectacles and his jack-knife. His model once more completed, he had a new machine constructed of brass, hollow throughout, so that the eye could examine all its parts. This was brought to our office nearly two years ago, when we noticed it once more, and gave to our readers some of the facts we have now recalled. The inventor was trying to secure a patent for this discovery, but the work went on slowly. The Patent Office required a working model to test the principle, and one was sent on to Washington. The moment the blocks were taken out, the wheels started off "like a thing of life"; and during 10 months that the model remained in the Patent Office, it never once stopped to breathe. The inventor had perfected two new machines, and made a very comfortable livelihood exhibiting them, prosecuting his efforts meanwhile to secure his patent, intending to apply the power to clock-work, for which it is peculiarly well adapted. Age crept upon him, however, before this point was reached; his highest art could not make his heart-beatings perpetual; and last Saturday afternoon he breathed his last in the old homestead at Freehold. He had been so much persecuted by the incredulous that he had provided a secret place beneath the floor of his shop where his last two machines were deposited. It was in the form of a vault, covered by a trap-door, which was locked, and the floor so replaced as to avoid suspicion. After his last illness commenced, he made known this secret to his family, who examined the spot carefully, and found the contents exactly as described. The night after his death the shop was broken open, the floor taken up, the trap-door pried off, and both models stolen. It is probable that the family, in their visits, had not taken the same precaution as the inventor, and some prying eyes had discovered the secret. Fortunately, the drawings are preserved, and there is a little machine, one of the earliest made, now running in Brooklyn, where it has kept up its ceaseless ticking for *nearly six years*. Mr. Hendrickson leaves a family of four sons and four daughters, all of them, we believe, given to inventions. Had he died 10 years ago, how emphatically would it have been said that his life has been wasted in the hopeless effort to obtain perpetual motion.—*N. Y. Journal of Commerce.*

Messrs. Editors:—I enclose a slip from the New York *Journal of Commerce* containing an account of an alleged discovery of perpetual motion, made six years ago by one James G. Hendrickson, of Freehold, N. J. Like kindred statements it would be unworthy of notice had it not appeared in so respectable and influential a journal; but having so appeared, it seems incumbent on the Scientific American, as the first and best authority on all mechanical subjects, to expose its fallacy. Let me ask two questions: Why was the invention never brought into use? How could the Commissioner of Patents be so regardless of Mr. Hendrickson's interests as to retain the working model for *ten months*, and finally not grant him Letters Patent? "There is a cat under the meal," and you must lay her bare; for too much material and intellectual wealth have already been exhausted in the pursuit of the above phantom. When a machine can be endowed with the power of alternately accelerating and retarding its own motions, through the possession of latent force, or in other words, be gifted with a *soul*, then we shall have perpetual motion. To those whose want of mechanical capacity prevents their seeing the philosophical fallacy of such an idea, it is only necessary to say, that the most ingenious minds have been applied to this subject, for centuries, without success. The conception of the *idea* of the needed improvement is "half the battle" to the inventor; and yet with the goal straight before them, no man has yet discovered perpetual motion; while it is only necessary for the Scientific American to suggest a desirable end, when presently its editors are overwhelmed with the means to accomplish that end. As examples, I will mention only marble saws, railroad sleeping-cars, corn-huskers, &c. Let doubters suggest almost anything except perpetual motion, and American inventors will not be found wanting in the day of need. So believes one of them.

W. S. T.

Boston, Nov. 22, 1859.

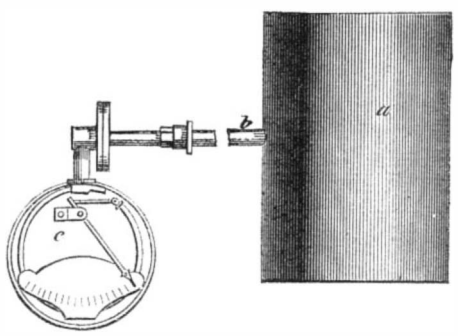
[Our correspondent is evidently a practical man, as he has hit the "perpetual motion" matter square on the head. We have taken the trouble to inquire at the Patent Office into the trnth of the assertion that such a machine ran for ten months at that office, and "never stopped to breathe;" and we have been assured that the statement is not true. Our readers will find some editorial remarks on this subject in another column.—Eds.

PYROMETER ON THE PRINCIPLE OF THE STEAM GAGE.

[Translated for the Scientific American.]

All the different devices usually employed for the purpose of determining the temperature of the air in furnaces, or ovens of any kind whatever, and known by the name of "pyrometers," present serious difficulties in their construction and application whenever it is required that such instruments should work with a considerable degree of accuracy, which, in some cases, is quite indispensable, especially in the baking of pottery and the distillation of coal.

The instrument represented in the accompanying engraving was invented by Mr. Noble, civil engineer at St. Petersburgh, and it is very well adapted to determine the temperature of ovens by a simple and easy proceeding; it is not at all complicated, and it can be applied with the greatest facility



It consists of a cylindrical air-tight vessel, *a*, made of platina, or any other strong material which can bear a very high temperature, and filled with air or any other gas. This vessel communicates, by means of a tube, *b*, also of platina, with a manometer or pressure-gage, *c*.

The vessel, *a*, is placed in the oven, and the tube, *b*, passing through an opening properly luted in the door-frame of the oven, is of such length that the pressure-gage can be readily attached.

As the air in the vessel, *a*, expands, it exerts a pressure which is indicated by the gage, and it has been found that atmospheric air or gas, at a temperature of 2,900°, exerts a pressure of 6 atmospheres, or 90 lbs. to the square inch.

In order to remove the inconvenience arising from this high pressure, rarified air or gas may be used, so that, at 42°, it exerts a pressure of $\frac{1}{4}$ atmosphere; at 510°, a pressure of $\frac{1}{2}$ atmosphere; and at 2,900°, a pressure of $1\frac{3}{4}$ atmospheres.

A small error arises on account of the lower temperature of the air in the conducting-tube. This error may, however, be calculated and deducted, or it may be reduced to a very small amount by giving to said tube the smallest possible diameter.

The length of the tube, *b*, varies, of course, according to different circumstances; but if it is very short, it is recommended to cool it by immersing it in cold water.

By means of this device, if one of Bourdon's or Ashcroft's pressure-gages is used, with an attachment to indicate the number of the revolutions of the index, it will be easy to measure the temperature within two degrees, which is a greater degree of accuracy than, in practice, is at all essential.—*Le Génie Industriel.*

INFRINGEMENT CASE.

UNITED STATES CIRCUIT COURT, NEW YORK.

Before Judge Ingersoll and a jury.

Nov. 11.—*Robert Marcher vs. John J. Sigler.*—An action-at-law has just been tried before Judge Ingersoll and a jury, for the infringement of the second claim under Letters Patent granted to the plaintiff, Oct. 21, 1851, and re-issued March 15, 1859, for a machine for coating or enameling moldings preparatory to gilding. The defendant pleaded the general issue, and gave notice that he should prove that the plaintiff was not the first inventor, but that a machine in all essential respects similar to the plaintiff's pretended invention was in existence and publicly used in this city, for the same purpose, as early as 1847 or 1848. Three witnesses were called by the defendant, all of whom testified to the existence and use of such a machine in 1847, 1848 and 1850. To meet this, it was shown by the plaintiff that, with his machine, a mere boy with very little experience could completely coat and enamel ten times as many feet of moldings as the most experienced man could do by the old hand method, and do the work much better, and completely finish them; that the machine referred to by the defendant's witnesses did its work very imperfectly, never finished the surface and possessed no advantage or so little advantage over the old method that, although those very witnesses ever since had been engaged in the business, they had not used it, and had never known any other person to use it. It was also shown by a witness summoned by the defendant, but put on the stand by the plaintiff's counsel, that, at the time testified to by the three witnesses, a model of the machine they referred to had been made; that the model was still in existence and in the possession of the defendant, and that that model lacked the essential feature of the machine patented by the plaintiff. It was also proved by several other witnesses that the owner and operator of that old machine continued to use it, constructed as represented by the model, down to the time of his death in 1854; always doing the work in the same imperfect manner, coating the moldings imperfectly and never enameling or finishing the preparation of a single molding for gilding. The jury rendered a verdict for the plaintiff, sustaining the validity of his claim under said patent; and as the defendant had used the machines but a few weeks before the suit, the damages were nommal. C. M. Keller, Esq. acted as attorney for plaintiff, and Geo. Gifford, Esq., for defendant.

Disease Produced by Sulphate of Quinine.—In a communication to the Academy of Sciences in Paris, M. Chevalier states that the workmen concerned in the manufacture of sulphate of quinine are subject to cutanous eruption, and also a peculiar fever. This cutanous eruption in some instances is very severe; not unfrequently it obliges the workman to remain away a fortnight, a month, or even longer still, and sometimes it makes it necesary for him to seek some other employment. The fever has not been observed in the manufactories of France, but only in that of M. Zurimer, at Frankfort, and there chiefly in those occupied in pounding the bark. This fever, also, may be so severe as to oblige the workman to relinquish his employment. As yet no prophylactic measures are known, and the temperate and intemperate would soon be affected equally.

Coal in Boston.—The amount of coal received in Boston for the year ending Sept. 1, 1859, was 630,187 tuns. The imports of coal from Great Britain were nearly double those of the previous year, though from Nova Scotia the quantity was about the same. From Philadelphia, Baltimore, Alexandria, &c., there have been received 530,000 tuns.

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COAL OIL.—SECRET INVENTIONS

MESSRS. EDITORS:—My attention was arrested by an article on the above subject, on page 316 of the present volume of the SCIENTIFIC AMERICAN. It is stated in the article referred to, that some companies make very pure oil, while others manufacture a very poor article; also, that those manufacturers who sell the superior quality keep their processes of purifying a profound secret. These persons are warned by you against the risk of having their secret processes invented and patented by other parties, who may possibly, at some future period, stop them from using these processes, although they may have been practiced long before the patent was issued. It is quite true that the law does not recognize secret property in inventions, and it is impossible that it can be otherwise; but, in regard to the purification of coal oil, I believe that the air of privacy which some coal oil manufacturers assume is more for the purpose of influencing out-door opinion than anything else. When an atmosphere of mystery is thrown around any process, an impression (whether correct or not) is created that an improved method of a very valuable character is secretly practiced. Those who manufacture coal oil, and produce a highly refined article, may do so by well-known processes, and by the use of well-known chemicals; and those who manufacture an impure oil may not have made themselves acquainted with what is known to chemists and others on the subject. I will endeavor to present most of the old, and some new, information relating to the manufacture of coal oils, which may be of some use to those engaged in this business.

The specification of James Young, published on page 186, Vol. XIV., SCIENTIFIC AMERICAN, contains a clear outline of the processes of distilling the coal and purifying the oil. It states that the retort containing the coal is to be heated to a low red heat, and the vapors which pass over, when condensed, are crude paraffine oil. The retort must not be heated too high, or gas, and not oil-vapors, will pass over. This crude oil is heated up to 150° Fah., in a cistern, by steam, and kept at this temperature for about 24 hours, when a number of impurities settle to the bottom. The oil is then run off into another vessel, and is afterwards distilled in an iron retort, which must not be raised above a very low red heat. The oil-vapors which again pass over are condensed in a worm placed in a cooler, and the oil is allowed to flow into a vessel lined with lead. In this tank, about 10 per cent. of vitriol (sulphuric acid) is slowly added to the oil, and the whole well-stirred for about one hour, then allowed to rest for 12 hours. During this period, the vitriol combines with the tar in the oil, and precipitates it in the form of sulphate of bitumen. The clear oil is now drawn off with a siphon, or by a tap, into another vessel; and for every 100 gallons of it, 4 gallons of caustic soda of the specific gravity of 1,300 (water, 1,000), are added and stirred. The soda neutralizes the free acid that may be left in the oil, and also removes some impurities. The oil is again drawn off and distilled at a moderately low heat; and this product is paraffine oil. By distilling this a fourth time, taking care to boil it well, with half its bulk of water, a clear, transparent fluid passes over, forming a beautiful coal oil.

This is Young's process, and, if carefully carried out, will enable any manufacturer to produce good coal oil. The operations, however, are tedious and troublesome; and unless care is exercised in managing the retorts, the oil will become a deep wine color, when exposed to the atmosphere. Different qualities, such as light, medium and heavy coal oil, pass over at the different temperatures to which the retorts may be exposed (as specified in the patent of Dr. Gesner, which was granted June 27, 1854), and are called "Kerosenes A, B and C."

In making experiments with coal oils, I have found that, when distilling the coal, a beautiful clear oil would pass over at the comparatively low temperature of about 350° Fah., and it would remain unaffected in color by exposure to the air. When the temperature was raised 100° higher, a denser oil would pass over; and, although quite clear when it first came from the retort, it rapidly became a deep wine-color.

The best way to treat the coal is to heat it in such a manner that the greatest amount of pure oil is obtained at first. The method described in Brown's English patent, to accomplish this result, is to distil the coal with superheated steam, then distil the crude oil thus obtained a second time by a similar apparatus (steam in a coil of pipe passing through a fire), when the light and heavy oils pass over. The oil is purified in the same manner as by Young's process (with sulphuric acid and caustic soda), and a very clear article obtained.

One great element of success in purifying coal oil depends upon the heat at which it is maintained when the vitriol is mixed with it. I have found that 212° Fah. is about the best temperature, and about 10 per cent. of vitriol, mixed with an equal quantity of water, amply sufficient. The vitriol is liable to spatter out, if undiluted and added to the hot oil; but if diluted, and added cold, there is no danger. I have also found that, by maintaining the heat at 212°, and agitating thoroughly for four hours, a great many more impurities are removed than if merely stirred and allowed to settle. The caustic soda exercises a powerful deodorizing as well as a purifying effect; but the oil requires to be agitated with it as thoroughly as with the vitriol. The churning manipulations in purifying coal oil are of the utmost importance. I have, in some minor experiments, obtained a beautiful oil by two distillations only. The first brought over the crude oil; this was purified with sulphuric acid, caustic soda and water; the last operation was the second distillation, carefully performed with long-continued low heat at from 400° to 600°. It is necessary to be careful, so as not to use too much acid, as it is liable to combine with some oil, and thus decrease the quantity of product. About five per cent. of sulphuric acid is, perhaps, as much as should ever be employed. A high heat has apparently the same effect upon oil as upon sugar; it renders it dark in the color. The clearest oils are obtained at the lowest points of temperature at which they are distilled.

Great complaints have been made against the offensive smell of coal oil; and it has been suggested that if a discovery were made, whereby its odor would be removed, it would be exceedingly valuable. The peculiar smell of this oil can be entirely removed, but at the expense of its quality. A small quantity of nitric acid and alcohol, mixed, and distilled with the oil during the third distillation, imparts a somewhat pleasant smell to the product. Every oil has its own peculiar odor; so has every gas; and coal oil is not exempt from the same law. When the creosote is removed from coal oil, all that can be expected in the way of removing its smell is accomplished. The oxyd of iron is a good agent for this purpose; so are caustic alkali and fresh-slacked lime.

Within the past 12 months, the coal oils manufactured in the neighborhood of New York have greatly improved in color, and they now burn with but little smoke. They are not so durable, however, as the more crude oils formerly sold, because they contain less free carbon, which is the great illuminating agent. They are more volatile, do not encrust the lamp-wick so readily, and, although they do not burn so long, they are altogether more pleasant for use. For the brilliancy of its light, no oil—vegetable, mineral or animal—can compare with that obtained from cannel coal; it is a paraffine oil, and its use must continue to increase because of its superior illuminating qualities.

In his patent of March 27, 1855, Dr. Gesner claims the use of fresh-calcined lime in purifying the oil: and it is a most excellent agent for this purpose. I have tried experiments with chloride of soda, made quite caustic, as a substitute for plain caustic soda ley, by agitating it with the oil in a close vessel heated from 150° to 212°; the results were very satisfactory. A dirty residue fell to the bottom, and a very clear product was the result. For removing the odor, I have tried dried blue clay reduced to powder, and added to the oil in small quantities, after it had been treated with acid and caustic alkali. The effect, by this simple agent, was much superior to that of the prussiate of potash, oxyd of maganese, and red oxyd of iron, which were also tried. I found both the acetate and nitrate of lead to be good purifying chemicals, but they are too expensive to use on a large scale. Care exercised in the distillation and the use of sulphuric acid, and thorough washing and agitation in caustic alkali, lime or soda, will purify coal oil completely by three distillations, and, with very great care, by two distillations.

I had intended to say something about the distilling-retorts and the lamps for burning coal oil; but as this communication is necessarily longer than I at first designed, I forbear.

R. M.

Williamsburgh, Nov. 21, 1859.

MERITS OF GALVANIZED IRON.

MESSRS. EDITORS:—I am unable to account for the fact that galvanized iron is so little used in the mechanic arts in preference to the bare metal, unless it is that those who might profit by it are ignorant of its advantages. Having need of some suitable metal that should have the requisite strength and durability to insure my property from repairs for a considerable time, I decided upon galvanizing all the iron used in building a vessel; also to substitute galvanized iron for copper fastenings, above as well as below the water-line. The vessel was built without a copper or composition bolt; her blocks are "Waterman's" iron-strapped, and every piece of iron about her is galvanized, including her chain-work and chain cables. She has been under a tropical sun between two and three years, and shows no mark of iron rust about her, nor the consequent decay of the wood. Another vessel, of similar build and size, in the same trade, a few months younger, not having her iron galvanized, presents a striking contrast; the latter has the appearance of an old vessel, the planking and timbers are destroyed or injured by the iron rust, and the fastenings, as well as her other iron-work, reduced to half their original strength.

The practical advantage and the philosophy of galvanizing were strikingly exhibited in the chain cables; the almost incessant exposure of these to the action of sea-water and their constant motion cause them to wear perhaps faster than any other portion of the ironing of a vessel. It is well ascertained that a chain of one inch and three-sixteenths iron is about twice as heavy and more than twice as strong as one of one inch. If a vessel requires a chain of an inch and one-eighth, or quarter, for *safety*, and it becomes reduced by the action of sea-water to an inch, the danger is apparent at a glance, and such reduction does take place speedily unless the chain be protected by galvanizing.

The chain cables thus galvanized, particularly the heavy ones most used, proved that the *protection* afforded is a *mechanical* one only just so long as the zinc covering remains unbroken, and that when the iron was exposed this protection became *electric*. The zinc slowly wastes away by the galvanic action, but so long as any of it remains in actual contact with the iron the latter is almost wholly protected; the zinc only being oxydized.

Two-and-a-half years' incessant use of this cable, have failed to make it produce a scale. It seems to me strange that, with the aptitude of our countrymen to adopt anything and everything to economize and protect, this galvanizing process should not be generally adopted. The nails and fastenings of out-door wood-work exposed to damp, for agricultural implements, or parts not requiring much temper, for railings, and for all iron requiring paint, indeed for *all* iron of permanent use and wear, not exposed to great heat, it seems to me invaluable. Every coarse metal except zinc destroys the fibers of the wood it fastens; the latter preserves it. That zinc preserves the metals it covers is, however, because it is electro-positive to all of them. Fences built with galvanized rails will last four times as long as with bar only; they will stand until the wood rots away; they cost two or three cents a pound more. Try them.

R. H. A.

CRINOLINE IN PARIS.—Only four years ago, crinoline came into vogue in Paris—the focus of fashions; and yet no less than 100 patents have been issued in France for improvements in this class of inventions. In 1855, 4 patents were issued; in 1856, 16; in 1857, 30; in 1858, 37; and up to the month of July last. 13. The ladies are great patrons of the inventors, and the gallantry of the latter has been amply displayed in its application to the personal graces and decoration of the fair.

AN EXTEMPORE MICROSCOPE.—When it is desired to examine a small object, and a microscope is not at hand, an extempore one may be quickly made by filling two small white glass bottles (such as homœpathic medicines are put up in will do) with water or other clear liquid. Cross these at right angles over one another, and look at the object through the cross, when it will be seen considerably magnified.

A good telegraph operator, working 10 hours per day, on paying messages, brings a receipt of about $75 to the treasury of the company employing him.

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ADVICE ABOUT PATENT EXTENSIONS.

During the year 1846, there issued from the United States Patent Office 619 Letters Patent for alleged new inventions. In looking over the official list, we recognize the names of several well-known inventors, who, during that year, procured patents for inventions of great value. Unless these patents are extended during the present year by the Commissioner of Patents, according to the acts of 1836 and 1848, all these inventions will become public property, and any attempt to revive them by special acts of Congress will be utterly futile: as it is a principle now settled in the minds of all persons who think about the subject, that Congress has no constitutional power to take from the public the right to use an invention after it has once become public property. Undoubtedly many of the patentees of 1846 will seek to obtain a renewal of their patents; and to all such, we have a few words of advice to give.

The questions which arise on all applications for extension are as follows: Is the invention novel? Is it useful? Is it valuable and important to the public? Has the inventor been adequately remunerated for his time and expenses in originating and perfecting it? Has he used due diligence in introducing his invention into general use? In regard to the question of novelty, a very searching examination is made at the Patent Office, as the primal element in the case; for if it is made to appear that the invention was not new at the time the patent was originally granted, the foundation-stone of the applicant's petition is removed, and his case fails. The other questions are vastly important, and will require great care in their exposition and presentation. There can be no arbitrary rules at the Patent Office in reference to the value of an invention, and the amount of remuneration received for it. But an invention must possess intrinsic utility; and this point must be fully proved in the testimony, or else the Commissioner will be justified in refusing the applicant's petition on this ground alone. There are doubtless thousands of patentees who could prove, to the satisfaction of the Commissioner, that they had not been remunerated for their inventions; it might, however, be a very difficult thing for them to prove that the fault was due to any other cause than their own negligence. A case recently came before the Commissioner, wherein the inventor sustained himself completely upon all points except the one of proper diligence. Here he signally failed; and the Commissioner, although he has large sympathies for the inventor, could not avoid rejecting his claim. Many patentees erroneously suppose that, if they can convince the Commissioner that they have made no money out of their inventions, he will grant them an extension. Hence, they jumble together a few affidavits on this point, sign and swear to petitions, pay in their $40 fees, and rest their cases; and, when too late to amend, they find their applications rejected and their inventions revert to the use of the public.

Patentees should not lose sight of the fact that the Commissioner, although having a very large discretionary power in extension cases, is nevertheless required to have due regard to the public interest, and must be satisfied that everything is just and proper before he can grant a renewal. If an inventor has used his patent oppressively, and has given the public no fair opportunity to derive benefit from its introduction—if he has used it as a monopoly to crush other patentees and manufacturers, by holding it *in terrorem* over their heads, he is not entitled to, and would scarcely receive, the grant of an extension. On the contrary, if an inventor has a valuable improvement, although he may have made a considerable sum of money out of it, if he has manifested a liberal spirit toward those who desire to use his invention, and has not used it as a monopoly to crush others who may have been willing to recognize his legal rights under the patent, a very strong point is gained, and one which will have much weight with the Commissioner. We do not mean to be understood to say that a patentee cannot enjoy an entire monopoly of his invention, or that he may not defend his rights in courts of justice; for, unquestionably, he has a perfect right to do both. But there is a sort of *savagery* sometimes displayed by patentees in enforcing their claims, and in pursuing, in an ultra-exacting spirit, all other inventors who may be sounding in the same depths as themselves, which spirit is often unjust and odious. Patentees should be exceedingly cautious not to offend the public, while in the enjoyment of the legal protection warranted by a patent; for, should a strong body, representing public interest, remonstrate against the extension, it will have deservedly great weight against the extension of the patent. Proofs in the case should be rendered clear and unmistakable on all the points involved; and, as a patent can only be once extended, it is obviously important that the case should be well prepared. We have been very successful, thus far, in procuring the extension of patents. One reason is, that we will not take up cases at random; but exercise the utmost diligence in examining all the points, so that when we take a case into our hands, we feel convinced, beyond a reasonable doubt, that we shall succeed with it. Persons who wish to consult with us on such cases, are invited to do so freely; and we will advise them, after a careful hearing of the case, whether it is advisable to proceed or not.

STEEL FROM CAST-IRON, WITHOUT FIRE.

We had received a letter on the above subject from Mr. A. G. Fleury (chemist), of this city, but its publication was unavoidably delayed last week. We will, therefore, now present only the substance of its matter, accompanied with a few remarks.

It is stated in the communication that a Mr. Thompson has lately secured a patent in England for making steel by the action of electricity alone, and that "he has succeeded in raising the large capital of £300,000, to exploit the invention." Our correspondent relates that, about two years ago, he made the acquaintance of two Hungarian gentlemen in this city, and that they exhibited to him knives, hammers, springs, &c., produced by a similar process, namely, galvanic action without the exposure of the iron to the fire. These foreign gentlemen, it is also stated, had filed a caveat of their discovery; and it is intimated that that their invention has been appropriated in England. Mr. Fleury also states that he has made experiments with rods of cast-iron by passing a powerful galvanic current through them when in a certain condition, and that the results coincided entirely with the facts related to him by the Hungarian inventors.

If cast-iron in a cold state can be converted into steel by simply passing currents of electricity through it, then we must say that this is perhaps the most important discovery of the nineteenth century. But, judging from the nature of cast-iron and steel, we cannot well conceive how such effects can be produced, because cast-iron is chemically not the same as steel; and all that electricity can effect is merely a different arrangement of the molecules of the metal. It cannot remove the surplus carbon and some other impurities which cast-iron possesses, and we therefore do not see how it can convert it into steel. We are aware that galvanic currents have been passed through iron in a *molten* state, and that steel has thus been made; a galvanic current may separate some of the chemical impurities from molten metal, but not from solid cold metal.

INNOCENT AMUSEMENTS.—We are frequently asked by friends visiting this city, what amusements they can attend, and take their wives and children, without any impropriety. Among the great number of pastimes now in the city we are pleased that there are a few which we can conscientiously recommend. "Drayton's Parlor Operas," at Hope Chapel, Broadway, while they are remarkably spirited and very amusing, are perfectly free from the usual evils of theaters. The singing is very fine and the acting of the highest order. *All* the characters are represented by Mr. Drayton and his wife; and the whole performance is entirely unobjectionable. In the same building may be viewed the magnificent collection of paintings known as "Waugh's Italy," which is also one of the harmless exhibitions which are well worth seeing.

The great india-rubber case of Judson & Goodyear *vs.* Horace H. Day was before Judge Neilson—United States Circuit Court, this city—last week, but what the end thereof will be we cannot tell. The suit involves the whole right and title to manufacture and sell the shirred rubber goods embraced in Goodyear's patent. It is a question of bargain, not the infringement or validity of the patent. Jas. T. Brady, Esq., of this city, is counsel for plaintiffs; Judge Curtis, of Boston, for the defendant.

A COLUMN OF INTERESTING VARIETIES.

The largest ingot of gold yet received from California was recently shipped to Europe. It is 11⅞ inches long, 5 wide, and 4¼ thick. Its value is $42,581.....The "time ball," which is to be dropped from the flag-staff of the Merchants' Exchange to indicate the precise moment of noon, has been ordered from Albany, where a similar one has been manufactured for use on the Capitol. Messrs. Chester & Co., of that city, are constructing the apparatus in connection with the New York one. This ingenious and useful contrivance will be ready for operation at an early day. The Dudley Observatory, at Albany, will furnish the time, and the Hudson River Railroad Company give the use of their telegraph line. .....Upon one occasion, when an application was made for the extension of a well-known patent, the remonstrant's counsel insisted upon it, that if the inventor had not been well paid for his time and ingenuity, it arose from his own blundering. "This," said Commissioner Holt, "is adding insult to injury; let the patent be extended."..... The Chiriqui gold-diggings are "played-out." The graves have been exhausted, and the value of the gold obtained will only amount to about $100,000. There is no digging going on now.....There was lately on exhibition at Sydney, Australia, a set of horseshoes made of native gold, weighing 24 ounces, and worth about $500. They were made for a favorite pony in New South Wales... ..Gold is 19 1-3 times heavier than water, and melts at a heat of 2,016° Fah. It may be hammered so thin as to require two hundred thousand leaves to make an inch in thickness..... The merchants and capitalists of Great Britain are estimated to own about 900 ocean steamers. A great portion of the immense trade of India, China, Australia and South America, is carried on through the medium of these steamships.....Two sheet-iron cars are in course of construction at the machine-shop of the Illinois Central Railroad, for the purpose of carrying powder and other dangerous combustible materials. They have india-rubber jointings and close up perfectly air-tight.....Orders have been received at Portsmouth, England, from the Admiralty, to furnish the necessary moorings for the *Great Eastern*, to be laid down preparatory to her arrival in Southampton water. They will consist of two anchors, of about 90 cwt. each; two blocks, of about 7 tuns each; and 130 fathoms of the heaviest mooring-chain, with a 22 cwt. swivel.....The monument inaugurated to the Emperor Nicholas, in July, cost $300,000..... The most singular spit in the world is that of the Count de Castel Maria, one of the most opulent lords of Treviso. This spit turns 130 roasts at once, and plays 24 tunes, and whatever it plays corresponds to a certain degree of cooking, which is perfectly understood by the cook. Thus, a leg of mutton, *a la Anglaise*, will be excellent at the twelfth air; a fowl, *a la Flamande*, will be juicy at the eighteenth air, and so on..... The government of Great Britain has purchased the patent right for perforating postage stamps of Mr. Archer, the inventor, for $50,000.....The surface of the Dead sea is 1,317 feet below that of the Mediterranean.....Elevating a barometer 85 to 90 feet in the air causes the mercury to fall one-tenth of an inch.....Cast-iron girders have been used in England 86 feet in a single span..... The qualities of certain well-waters are so injurious to animals that at Willesden, in England, the Messrs. Tattersall were compelled to discontinue the use of well-water for their racing stock and brood mares.....An explosion of a large quantity of gunpowder at Hounslow, England, produced shocks resembling an earthquake at a distance of 60 miles.....The number of hoop skirts made in Derby since April 1st, is said to be 950,000, consuming at least 9,100,000 yards of tape, and 445 tuns of steel.....Chickens of a new breed, called "Ecliptendean," are being introduced into this country from abroad. Instead of feathers, they are covered with hair like that of lap-dogs, very white, soft and beautiful, and have curious red ornaments on their heads. The Wheeling *Intelligencer*, of a late date, describes a couple which had been brought to that place on the road to Pittsburgh, for some fowl fancier who had imported them.....The Moharajah of Cashmere has sent as a present to Queen Victoria a most costly shawl-tent which will contain, moreover, a bedstead of solid gold. The value of this royal offering is said to exceed 15 lacs (£150,000).

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IMPROVED MOLDING DEVICE.

This is a contrivance for facilitating the operations of metal casting, being an improved plan for withdrawing the patterns from the molds. The patterns are split in halves, and each half is placed upon a rectangular wooden block, which is fashioned to correspond with the profile of the pattern. Holes are then cut in a thin board to correspond in form with the wooden blocks, so that these may be raised and lowered through the holes with a vertical motion. An inspection of the engravings will show the arrangements of the plan.

The figures of the keys, *a* and *a'*, are two halves of a pattern, *b* and *b'*, being two halves of another pattern. The cut shows the patterns when raised into the proper position to be covered with sand for the mold, a part of the board through which the patterns are lowered being broken away to show the form of the wooden blocks, *c c*. The engraving represents an arrangement adapted to a hinged frame, the hinges being precisely midway between the two halves of the pattern, and the halves of the frame folding together when the mold is formed.

The wooden blocks which support the patterns rest on a frame-work below which receives a vertical motion from the sliding horizontally of two or more inclined planes on which it rests. The operation of these inclined planes is shown in Fig. 2, the full lines representing their position when the patterns are raised above the board, and the dotted lines their position when the patterns are lowered from the molds. Suppose the broken portion of the board restored and the patterns resting as shown. Place the hinged frame on the box and fill with sand properly pressed in. Now, by slowly turning the hand wheel, C, the screw to which it is attached will gradually withdraw the inclined planes, slowly lowering the patterns from the molds in a very steady manner, thus disturbing as little as possible the sand of the molds. When the patterns are withdrawn, the halves of the hinged frame are to be folded together and the mold is complete.

It is said that practical experience has shown that a much smaller proportion of molds are injured in drawing the molds by this plan than by the old method, and that it may be done by comparatively unskilled workmen.

The patent was granted May 24, 1859, to Chapman Warner, of this city, and the same has been assigned to Dickinson & Co., of Greenpoint, L. I., to whom inquiries for further information in relation to it may be addressed.

Fig. 1

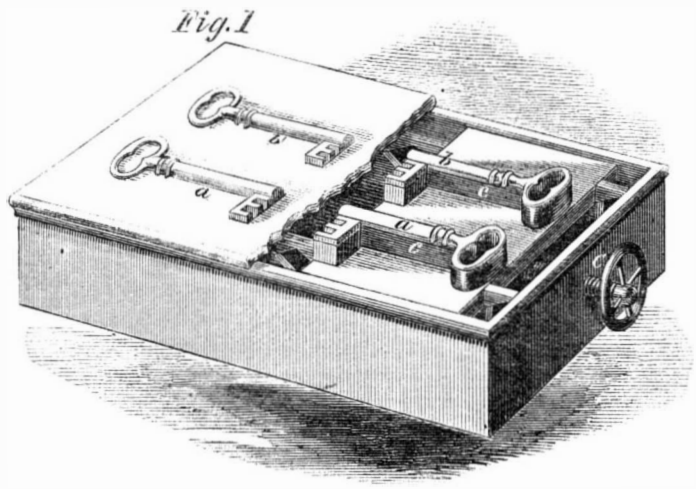
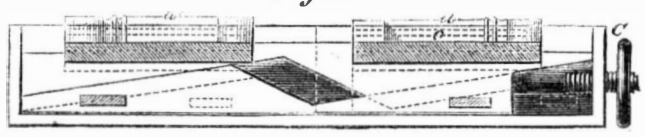


Fig. 2

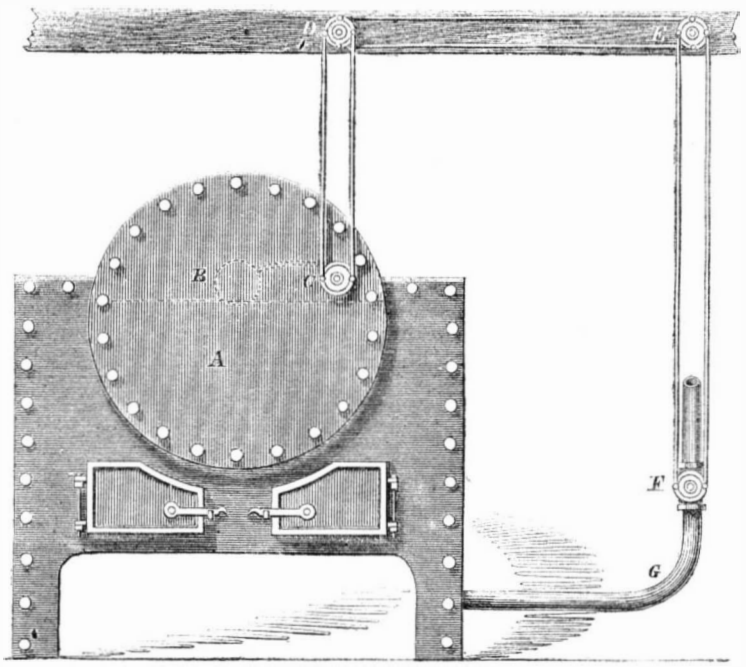


WARNER'S MOLDING DEVICE.

IMPROVEMENT IN VALVE RODS FOR SELF-FEEDING BOILERS.

This invention consists essentially in providing double rods for connecting the float in the boiler with the valve in the induction-pipe, in order that the strain on the rods may be pulling instead of pushing, thus avoiding all vibrating or springing of the rods.

In the engraving, A represents a steam-boiler, with the float, B, inside resting upon the water. The arm of this float is rigidly fastened to a small shaft which passes steam-tight through an opening in the head of the boiler and carries the wheel, C, upon its end. The wheel, C, is connected by double rods with the wheels, D E, and F, as shown, so that the oscillations of the wheel, F, correspond with those of the wheel, C. The wheel, F, is fastened upon the end of the axle of a stop-cock or valve in the induction-pipe, G. The water in the pipe beyond the valve from the boiler must, of course, be subjected by some means to a pressure equal to that in the boiler. It will be seen that as the float, B, falls, the wheel, F, and consequently the the valve, are turned, and thus water is let into the boiler, while the rising of the float again to its place closes the valve and thus stops the flow of the water into the boiler; one series of rods being pulled to open the valve and the other to close it.



CURRY'S IMPROVEMENT IN VALVE RODS.

The patent for this invention was granted Oct. 18, 1859, to William P. Curry, of Vincennes, Ind., who may be addressed at that place for any further information in relation to the matter.

THE BUFFALO BIG SHIP.

We noticed on page 305 of the present volume of the SCIENTIFIC AMERICAN, the proposition which R. Germain had made public for constructing a steamer to run at the rate of 100 miles per hour, and carry freight at less cost than can be done by any of the steamers which navigate the ocean at present. Since we published our remarks, Mr. Germain has delivered a series of lectures explanatory of his system to the enlightened citizens of Buffalo, and brief reports of them have appeared in the *Republic* of that city, whose editor has become deeply impressed with the feasibility of this great aquatic project. We sincerely regret that our brother-chip has been so deeply deluded by such views as those put forth by the projector of this scheme. The whole project is based upon the construction of a very long ship (4,000 feet) of light draft, and the placing of engines in her of such power as will work up to the speed desired. Mr. Germain is not acquainted with the very first elements of steam marine science. He states that, as the resistance to a vessel is as the square of the speed, a quadruple power doubles the velocity. He is not aware of the fact, that to double the speed of a steamer, the cube of the power is required. This is a practical fact. All his calculations, therefore, are based upon an error, and his project takes the form of a great conjecture.

STEAM-BOILER INSPECTION.

The *American Railway Times* in its issue of Sept. 24th published the following:—"On this subject of increasing importance (boiler explosions), should the SCIENTIFIC AMERICAN collect all the facts that have appeared in its columns. they would form a respectable volume, and whenever the cause of explosions shall be thoroughly understood, the above-named paper may claim a large share of the credit of throwing light on a matter of the greatest moment."

We have frequently directed attention to the necessity of having a proper system of inspection for steam-boilers on land as well as those of our river boats carrying passengers, because there is just as much necessity for the one as the other. We have also suggested that, in this city and others where manufacturing operations are carried on, and where there is danger to the operatives engaged, on account of defective boilers and the employment of incapable engineers, there should be a rigid boiler inspection system. It affords us pleasure to state that measures have been instituted by our city authorities to carry such suggestions into operation. Shortly after the explosion of the boiler at the Girard House (this city), on the 30th of last September, the Common Council appointed a committee to inquire into the subject, and the result has been the examination of various engineers, boiler-makers and others, to obtain specific information regarding the whole question. On the evening of the 14th inst., the committee held its final meeting; and from the nature of their proceedings, we judge they are prepared to carry out a proper system of inspection. They have advertised for competent engineers, and from this we judge that a Board of Inspectors is about to be appointed. This is a right move in the right direction; and when the organization of the Board is more fully developed, we may again take occasion to say something more on this topic.

THE NEW TIME BALL.

At the Greenwich Observatory, in England, an elevated colored ball or sphere is erected, and so operated as to descend exactly at noon, and thus indicate the correct time to captains of ships, railroad engineers, and others, who are deeply interested in the accuracy of their chronometers. In Liverpool, there is a similar arrangement, and it has often been suggested that a great shipping port like New York should not be without a like visual time telegraph. The absence of an observatory, however, has prevented the design being carried out, but we learn with pleasure that measures are adopted for the erection of a time ball on the dome of the State House at Albany, and the ball is to be operated by electro-magnetism, through a wire, from the Dudley Observatory. This time ball is already constructed by Wm. Eddington, of Albany, and will soon be in its place. It is 4½ feet in diameter, weighs 62 pounds, and will descend twenty feet every day, exactly when the sun has reached meridian. It ha also been proposed that a time ball be erected on the Exchange, in Wall-street, this city, and operated by telegraph from the Observatory at Albany. Is this great city so destitute of scientific enterprise, as to allow itself to be dependent upon Albany, which has not one-tenth the number of inhabitants, for its meteorological and astronomical observations?

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Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York.

O. D. MUNN, S. H. WALES, A. E. BEACH.

TERMS—Two Dollars per annum.—One Dollar in advance, and the remainder in six months.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in the United States and Canada.

Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

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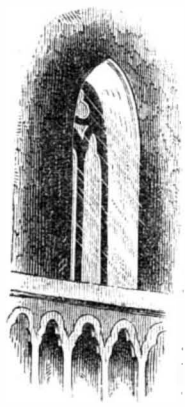
VOL. I., No. 22.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, NOVEMBER 26, 1859.

ARCHITECTURE AND BUILDING MATERIALS.



IF there is one characteristic more than another for which the city of New York is eminently distinguished at present, it is that of architectural progress. A spirit of intense emulation pervades the minds of her princely merchants, to outrival one another in the erection of splendid structures for business purposes and family residences. We have been informed by several parties who have recently returned from Europe after extensive tours (and we believe their statements), that the buildings lately erected and those now in the course of construction in New York surpass in grandeur and beauty the most of those in any city in the Old World. If the same spirit now exhibited in this department is maintained for 50 years longer (and we see no reason why it may not for hundreds of years), all the cities of ancient and modern times will be as far excelled by the metropolis of the New World as Paris surpasses smoky Liverpool.

The personal independence of our people, and the absence of that blind adoration for *past art* which is peculiar to the older nations, are amazingly displayed in the variety of styles and originality of designs carried out in our new buildings. In the same street may now be seen an elegant structure of red sandstone brought from the valley of Connecticut; adjacent to it, another of snow-white Tuckahoe marble; close to that, one of Dorchester freestone; a fourth of cast-iron, and beside it, a handsome brick edifice. Some persons find fault with this great variety, and contend for more uniformity in the materials as well as in the styles of buildings. Such objections savor of "red tape-ism;" it is variety which imparts the continual freshness to natural scenery; and art fails to reach perfection when it loses sight of the laws of natural beauty. A city of palaces—each an imitation of the other in style and material—would be a dull and spiritless place; it might be rich and grand, but not beautiful. As different persons display their various tastes for clothing by chosing all kinds of colors and materials, so in architecture the same difference of tastes is perfectly natural, and should not be discouraged, but cultivated and extended. This is one reason why we have welcomed every new and useful material for building purposes which has been introduced, and why we have frequently alluded to the employment of iron as a building material. The first structure ever erected with walls entirely of cast-iron was put up this city in 1847; and since that period many buildings of the same metal have been put up in several of our cities. It is worthy of remark that this material was not thus introduced by the regular-bred professional men; they condemned it generally, as being unsuited for the purpose. It was asserted that it would soon rust entirely away, and that being such a good conductor of heat it would expand and contract so much and so frequently, by atmospheric changes of temperature, as to break all its joints and soon fall to pieces. Most of the great inventions have been discovered by men not reared in the arts which they improved, and they were generally opposed at the outset by those whose pursuits were revolutionized. Men educated to a certain profession are very liable to imitate those who have gone before them, rather than strike out bold and original plans for themselves. This may account for the prejudice which has existed against the use of iron in architecture by many professional architects. The first iron building to which we have alluded has just been taken down for the purpose of widening the street in which it was situated; and instead of the predictions being fulfilled which had been made regarding its failure, when erected, they have turned out to be absurdities. Not a joint of it has failed or moved a hair's breadth; not an inch of it has decayed by rust; and after standing 11 years it is as sound as when first put up, and can now be again erected in another part of the city as completely as upon its first site.

We had thought that experience and observation would have convinced our architects that their former notions regarding iron as a building material were incorrect, and that their prejudices would have been removed; but this is not the case. A discussion recently took place on this topic before the American Institute of Architects, in this city; and a periodical devoted to the art reports, with some commendation, some most unscientific and erroneous conclusions, that had been advanced against iron. We will quote a few of these to show the large class of our readers who are engaged in building pursuits, how very unsound and ridiculous are the reasonings put forth by professional architects on this important subject. "It [iron] is combustible in the fullest sense of the word; it not only loses its solidity at a moderately high temperature, but is entirely consumed by exposure to heat for a moderately short space of time, say the duration of a fire opposite. The only difference between iron and wood in combustion is, that wood in heat is evolved into gases which mingle with the air, which we call ashes [funny idea]; while iron absorbs a portion of atmospheric air, and when burnt forms a mass of oxyd of iron larger and heavier than its original bulk." More incorrect and unscientific trash could not have been given to the public on any subject. It is plainly asserted that iron not only loses its stability by exposure to a moderaetly high heat, but that an iron building will be entirely consumed by exposure of not long duration, to "a fire opposite," meaning the opposite side of the street we conclude. It is also asserted that iron is as combustible as wood. If what is stated above were true, there is not a stove in the country but would be converted into a mass of brittle oxyd during the first fire kindled in it. We could not have imagined that such nonsense would ever have been published, as coming from professional men. It is evident that they are wilfully stupid on this subject, or are ignorant of the nature of the materials, both chemically and mechanically. If the statements we have quoted are accepted as truths by our architects generally, then they have been guilty to an unwarrantable extent, in the recent employment of iron. If it is so unstable and so combustible, why is it employed so frequently for beams, girders and columns to support heavy walls of marble, stone and brick? If, as is asserted, it will be consumed by exposure to a moderately high heat, during a moderate space of time, why is it now so generally used in such dangerous and important positions as that of supporting heavy arches and floors? This is a serious question for our architects to settle among themselves; for if the opinions quoted are true, then very many of them have proved recreant to the interests of those whose expensive buildings they have designed and superintended.

The following are our opinions regarding the nature of iron as a building material, and we maintain that we are correct. It is not combustible in the common sense of the term, and it does not lose its stability at a moderately high temperature. No comparison should have been instituted between it and wood. It cannot be oxydized by exposure to a red heat for a whole month, except a very small scale formed on the surface. It can only be oxydized at most intense heat, when in a fluid state, exposed to the air and a strong blast in a furnace. Such a thing never can occur with iron in a building; were it otherwise, our fire-proof iron safes, our shovels, pokers, tongs, pots and pans, might as well be made of wood as iron. That such egregious errors as those mentioned were ever published in any periodical professedly devoted to architecture is enough to make the bones of Christopher Wren rattle in their coffin.

We are not pleading specially for iron as a building material. Let marble, stone and bricks have their allotted places; but we assert that iron has done more for ornamental and other improvements in architecture, during the past 10 years, than any other material. We have watched its progress, and attribute much of the ornamental improvements in all the recently-erected buildings to its influence. The richness and variety of its moldings have stimulated the workers in stone and marble to higher efforts of their art in buildings; hence, the increasing beauty of our city structures. It has been asserted that the deep cutting and the "relief" which are produced in stone cannot be effected in iron castings. This is an error; there is not a piece of stone sculpture to be found, for which we cannot find a molder to cast it in metal. Apart from the use of iron for walls and ornamental architecture, for which it is well adapted, its employment for girders, which has become so general of late, has been of great service to architecture. It permits of bold flat and other arches being erected with a facility hitherto unknown, and its great strength enables it to support heavy superincumbent walls in a manner superior to any other known material.

PERPETUAL MOTION

We publish, in another column, a very pathetic and well-told story of an inventor who, for the last 40 years of his life, was engaged in the pursuit of that most intangible of all *ignis fatui*—"perpetual motion." The story is taken from the New York *Journal of Commerce*, and thus commends itself to favorable consideration. We saw the self-same story, substantially as now published, "going the rounds" of the press some 18 months ago; and it is now revived with the sad intelligence of the inventor's death, who is represented as having eked out a scanty support by the proceeds of the exhibition of his machine. As several of our readers have called our attention to the above fact, and have sought our opinion regarding it, we will now offer a few remarks upon a subject which has racked the brain of many a misguided genius.

We have long thought the phrase, "perpetual motion," is remarkably inappropriate for expressing the idea which it is generally used to convey, and that an examination of it would lead to clearer conceptions, not only in regard to its meaning, but also in regard to the general operation of the forces of nature. It is probable that the prevalence of the category of fallacies which are recognized as "perpetual motion" is owing, in no small measure, to a want of distinct ideas of what is meant by the term. The efforts of lexicographers to define it have been singularly unsuccessful, and it is probable that there is no short form of words which will express its meaning as it is understood both by the deluded individuals who have been its victims and by the sound mechanicians who have laughed at their folly. We shall not attempt the task which has baffled the great masters of language—that of giving a brief definition of the phrase; but we may, perhaps, by a more ample exposition, succeed in arriving at a better understanding of its signification.

In the first place, the phrase is not to be understood in a literal sense, as equivalent to the meaning of the two words when taken separately. There is no difficulty in putting matter in motion, and keeping it in motion perpetually. In fact, all the matter that we know anything about—the whole visible universe—is in motion, and is probably destined to continue in motion forever. The thing which it is impossible to do is to *stop* any portion of matter from moving perpetually.

There are known in nature at least seven forces which are capable of moving matter; they are Heat, Gravitation, Muscular Power, Magnetism, Electricity, Chemical Affinity and Capillary Attraction. Whether some of these are identical with each other, and whether light and other forces should be added to the list, is wholly immaterial in this connection. Of all the forces of nature, there are three which have such superior properties for mechanical purposes that they have superseded all others for practical use. These are gravitation, heat and muscular power. It is very easy to apply heat and gravitation to matter under such conditions that they will move it perpetually. The heat of the sun expands water into vapor, which floats away in the atmosphere to the tops of the hills, where it is condensed by the cold, when gravitation draws it down the sides of the hills to the sea. If a wheel is placed so that the running water may properly act upon it, it will cause it to turn as long as

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the material lasts; and if the material is indestructible, the wheel will turn forever. Thus is unceasing motion produced by a combination of heat and gravitation. Heat alone will also cause a wheel to turn continually. Delicate clockwork has been so connected with a very long iron bar that the expansions and contractions of the bar, from the varying temperatures of day and night, have kept the clockwork in constant motion. Gravitation also produces a mechanical motion without interruption or end. The tides are caused by the alternate attraction of the moon and earth; the attraction of the moon raising the water, and that of the earth drawing it back to its level. By having a large wheel to pump water into a reservoir during the hours in which the tide is flowing, and by then drawing the water from the reservoir to turn a small wheel, there is no difficulty in constructing a tide mill that will never stop. Even muscular power causes motions which, if they resulted from some of the fallacies which have been tried, would be recognized as "perpetual motion." It is not very uncommon for the human heart to beat day and night, without a moment's cessation, for more than 80 years.

What is it, then, that the seekers of "perpetual motion" have attempted to do? Have they attempted to move matter without exerting any force upon it whatever? Not at all. Probably not one of the most stupid numskulls who have pursued this phantom has ever thought that he could induce a mass of inert matter to start from a state of rest, without directing the action of some force upon it. One of the most common plans for "perpetual motion" has been the swinging of a pendulum; that is, by the simple power of gravitation. Now, motion is produced simply by this power in the case of the tide mill, as we have seen. But the tide mill is constructed in accordance with the laws of motion, and the pendulum of ceaseless vibrations is not. This, then, appears to be the distinction: A continual motion of matter which is effected by arrangements made in accordance with the laws of nature is not, technically, "perpetual motion;" but the phrase is applied exclusively to attempts to produce such motion by means which are *not* in accordance with the laws of nature. Indeed, the phrase is very generally, if not universally, applied to all mechanical fallacies. We recently examined a steam-engine, which had been built at considerable expense, and in which the inventor supposed that he was going to multiply the power of the steam because he applied it at the periphery of a wheel and connected his mechanism with the shaft, thus getting a "leverage." This would no doubt be generally regarded as belonging to the class of fallacies which are all embraced under the term which we are considering. Even the plan for propelling a boat by a man sitting in the stern and blowing with a bellows against the sails will, we presume, be universally regarded (because no motion can thus be produced) as a perfect illustration of the fallacy of "perpetual motion;" although, if motion were thus produced, it would not be perpetual.

If we are correct in our apprehension of the meaning which the term "perpetual motion" has acquired in the community, it signifies *a popular fallacy*—an attempt to produce or increase motion by means which are manifestly absurd or unsound — which are not in accordance with the properties of matter and the laws of nature. Hence, it follows that a machine which does actually operate, may be in motion perpetually, but it cannot be, technically, "perpetual motion." So twisted has the meaning of this word become, that "perpetual motion" actually means motion which will *not* be perpetual. If Mr. Hendrickson (the hero of the story alluded to in the first paragraph of this article) constructed a machine which moves constantly, he has, most assuredly, constructed it in accordance with sound mechanical principles, and has subjected it in a proper manner to the action of one or more of the forces of nature; and, in doing this, he has done no more than wise mechanics have done for thousands of years. But if he has been wasting many years in building a machine which he supposed would operate, but which will not, then has he been a victim to the pursuit of "perpetual motion."

SUBSCRIBERS who write to us for information will please to observe our rule to give us their names—not for publication, but as an evidence of good faith on their part. We will not answer letters of inquiry unless this request is observed.

A REMARKABLE METEOR.

One of the largest and most brilliant meteors ever seen passed directly over this city at 9½ o'clock, on the morning of Nov. 15th. Its course was in a S. S. W. direction, and was observed for more that 150 miles—from the neighborhood of New Haven, Conn, to that of Absecum, N. J. It seems to have thrown off red-hot scales in its flight till it arrived over the south-east corner of New Jersey, when it exploded with a shock that shook the ground like an earthquake.

The passengers in the stage between Middletown and New Haven, in Connecticut, saw a fiery ball descend to the earth, apparently a few hundred yards from the stage. Search was made for its traces, but none were found. In the upper part of this city it was witnessed by several policemen and by numerous other persons.

Sergeant Clinton states that he was engaged in writting at his desk, near a window in the station-house in Eighty-sixth-street, about 9½ o'clock on the above morning, when suddenly a flash of light, as from an ascending rocket, was reflected upon the desk, which caused him instantly to cast his eye from the window, when he perceived an immense ball of fire of striking brilliancy, and in size as large as a cannon ball, with a tail some 30 feet in length, resembling that of a comet, which, while passing through the air, left behind a fiery trail. It appeared to be shooting in a direction from the north-east to the south-west, and instantly disappeared, apparently striking the earth some 200 yards from the station-house. Officers Cavanah and Wright, who were within a few feet of the station-house at the moment, also saw the meteor, the appearance of which struck them so forcibly with amazement as to cause them to alarm others who were within the building, but who, of course, did not perceive it, owing to its sudden disappearance. The officers who, to the number of four or five, went in search of the spot where the meteor is supposed to have fallen, state that the excitement among the residents of that neighborhood (many of whom witnessed the occurrence) was very great, and that it was impossible to arrive at any correct conclusion as to the precise place where it fell, from the conflicting accounts given on that point. Mr. C. H. Reed, acting in the employ of the Commissioners of the New Reservoir, states that he was on the pier at the foot of Ninety-first-street (E. R.), unloading lumber, when his attention was attracted by the singular appearance of a ball of fire shooting swiftly through the air, apparently in an E. S. E. direction. He called the attention of the workmen to it, who appeared to be struck speechless with wonderment. Officer Flynn, of the Central Park Police, states that he was patroling the "promenade" within the park at the time, when he perceived what appeared to him to be a ball of fire, having a tail like a comet. He says he saw it disappear behind the trees, but thinks it fell within the park enclosure. John Berry, one of the laborers in the park, confirms the above statements as to the appearance of the object and the time specified. A man in a schooner on the North river saw a fiery ball strike the water about 50 yards from his vessel.

About the time above-mentioned (9.30 A. M.), a rumbling noise, accompanied by a perceptible trembling of the ground, was experienced all along the line of the Camden and Atlantic Railroad, from White Horse station to the beach. The noise was heard for about two minutes, and some persons thought it resembled a heavy powder explosion. A passenger, who got on the train at Absecum, stated that he had seen a large red ball, which flew across the sky and burst into fragments.

IRON AND WOOD FOR SHIPS.

In directing attention recently to the rapid increase of foreign iron steamers, we stated that they cost less than wooden steamships; and we exhorted all those interested in this very important question to look to this field for regaining our lost commerce. Since the article referred to was published on page 305 of the present volume of the SCIENTIFIC AMERICAN, we have received several letters from shipbuilders (some of whom are highly distinguished for ability) in which some exceptions are taken to our remarks. They contend that wood is both cheaper and better than iron for constructing vessels. They say: "Iron is cheaper than timber in England, and is therefore the most economical material for building steamers in that country; but the reverse is the case here—we import our iron, our wood is cheaper, and it is therefore the best material we can use."

The opinion we expressed was that iron screw steamers were built in England cheaper than wooden vessels of the same character anywhere. We had been told that this was the case, and were somewhat cautious in accepting the information; and from further inquiries, we are convinced that no mistake was committed. The important question for consideration is, not that wood is now cheaper than iron in New York, for such purposes, but is iron cheaper anywhere? and if so, then it becomes us, as a progressive and enlightened people, to see if we cannot get it as cheap as the people of England. We know that wood never can become cheaper, but will always be rising in price; whereas, we are aspositively certain that great improvements may be made in the manufacture of iron, to render it much cheaper than it is at present. Unless our naval architects and shipbuilders embrace such views, we shall make no progress—we will go behind.

It is somewhat singular that, during the time we were penning our remarks on the article in question, a letter from our distinguished shipbuilder, Donald McKay, of Boston, was on its way from England, containing views very similar to those which we had published. This letter will be found on another page, and we invite attention to the information contained in it.

SEWING-MACHINES AND THE AMERICAN INSTITUTE.

MESSRS. EDITORS:— Some of our friends not seeing the Wheeler & Wilson sewing-machine named in the premium list of the American Institute, published in your last issue, inquire what position it occupied. We beg to inform them through your columns, that the Institute, as usual, awarded our machine the highest premium for family use and for manufactures in the same range of purpose and material. To be sure, no medal was awarded to our machine this year, for the reason expressed in your last number, that the Institute award the same class of medal but once on the same machine, and ours has received medals at previous exhibitions. The committee arranged the machines in four classes, according to general merit, and accorded us the first place in the first class.

This award has been so general and uniform at various fairs throughout the country, for several years, that it may be regarded as embodying the well-established public opinion.

WHEELER & WILSON MANUFACTURING CO.

New York, Nov. 16, 1858.

REMOVING MILDEW FROM LINEN.

MESSRS. EDITORS:—I observed, on page 283, present volume of the SCIENTIFIC AMERICAN, a call on your lady readers for an efficient and simple remedy for removing mildew from white clothes. Let me observe, in the first place, that clothes do not mildew except in what are generally termed "dog days," at which time the remedy is always at hand. First steep the clothes in salt and water for a few minutes, then take as much of the juice of tomatoes as is sufficient to cover the parts affected; steep 24 hours, then wash out with soap and water, and let the clothes dry. The same remedy will also remove the stains of copperas-water.

Mrs. H. S.

Carnelton, Ind., Nov. 20, 1859.

GREAT STORMS AND SHIPWRECK.—By recent news from Europe we learn that the British coast had been visited by very severe storms, by which many vessels had been wrecked. One of the most heart-rending on record was that of the steamer *Royal Charter*, which had made a most successful and rapid passage from Australia, with about 500 passengers and 79,000 ounces of gold. Everything went well until she had nearly reached Liverpool, when she was overtaken by the tempest and driven upon the rocks. Out of the whole number of passengers only 39 were saved; all the rest perished; it is said, within only *ten* yards from the shore! The scenes on board during the last hour were painful beyond description.

TURNING IRREGULAR FORMS.—It having been claimed for old Sir M. I. Brunel that he had invented a machine for turning irregular forms, as stated on page 241 of the present volume, a correspondent, writing to us from Boston, asserts that it has been decided in several patent suits that Brunel's machinery, erected at Portsmouth, England, for turning ships blocks, as described in English encyclopedias, cannot turn irregular forms.

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FOREIGN SUMMARY—NEWS AND MARKETS.

The logwood tree of Honduras is that which is chiefly employed for coloring black, upon silk, cotton and wool, in print and dye-works. This species of dye-wood has greatly decreased during the past ten years, and some substitute has been lately sought after with avidity. It is stated in one of the French periodicals that a tree, growing in great abundance in Algeria, has lately been found to possess the property of dyeing a beautiful black, and that it can be used to supersede logwood. If this is so it is a valuable discovery.

In Cayenne there is a tree which bears a species of wax possessing all the properties of that obtained from bees, but until lately, no attempts have been made to cultivate it, and it exists in very limited numbers in a wild state. In Algeria, which seems to be a place specially adapted for the cultivation of rare vegetable products, the wax-tree has been planted and cultivated in the government gardens with such success that vegetable wax, as an article of export, may be expected from that country in a few years hence.

In a government report published in Paris, it is stated that the number of fires has greatly increased in France during the past ten years; most of these have been traced to the careless use of friction matches. Children, in many instances, have thoughtlessly set fire to buildings with them; and in several cases, they have ignited by being tread upon when lying on the ground among combustible substances. It is recommended that more vigilance be exercised in keeping them in secure boxes, or that their use in the present form be greatly curtailed. It is also suggested that the old lucifer match be again brought into use. It consists of two separate parts, as it were, namely, the match tipped with sulphur and oxyd of lead, which cannot be ignited, and a small phial containing phosphorus, into which the match must be dipped to set it on fire. Such matches could not be ignited by by children; but we do not believe that more safety from fires would result from their use, because more phosphorus would be exposed, as every house would require a small quantity of it, and careless persons would be just as heedless of its danger as they are of the friction matches.

The Netherlands government publishes a report of the trade carried on in Nagasaki, Japan, from Oct. 16, 1857, to July 4, 1859, and the statistics gave a flattering idea of the commercial prospects which lie before the civilized nations when Japan and China are fully opened. During the period referred to, 149 vessels arrived at Nagasaki, and all foreigners were freely admitted by the authorities, the flag of the ship only being scrutinized. So brisk was the trade that the authorities were nearly overwhelmed; but still they endeavored to meet it in a liberal spirit, with the exception of the "Commercial Corporation," a sort of native "Chamber of Commerce," the members of which have enjoyed a monopoly. Warehouse accommodation was very much required. The Japanese junks coming into port were increasing in number. Within two years Japan will furnish a good supply of raw silk, but at present her exports are not well suited for European or American markets. Coal is sent to China with a fair and steady supply. A police has been organized in Nagasaki, and foreigners were well treated. Vessels were repaired there more satisfactorily and cheaper than in Shanghae, in China.

As the greatest danger in ballooning arises, not when going up or sailing, but when descending, by coming in collision with trees or by the balloon bounding like a ball when striking the ground, a correspondent of the London *Builder* suggests that strong spiral springs be secured to the bottom of the car so as to act as safety-buffers in such cases. It is even suggested that such springs may be made so powerful that if the car of a balloon were to be detached from the netting at a considerable elevation, they would be the means of rendering the descent to the earth comparatively harmless.

Quite a number of arrangements have been adopted for burning illuminating gas in fire grates as a substitute for coal fires. Asbestos has been strewed over the grate and the gas allowed to flow through it, so as to spread it out in thin streams and produce a beautiful glowing flame. Perforated firebrick and soapstone have also been employed for the same purpose, and all of these seem to answer very well; but M. Ohren, C.E., has published a communication in some of the London periodicals, in which he states that plumbagine is the best substance which he has yet tried in gas grates. This material is the hard coke which adheres to the interior of gas retorts; it is broken into lumps about three cubic inches in size each, and piled carefully in the grate. It absorbs a great quantity of gas, makes a most excellent fire, and throws out a great deal of heat with a very small consumption. A bushel of it will last in a grate for about three months.

It is decided that the *Great Eastern* shall not make her ocean trial trip across the Atlantic this year. She has been taken out of the hands of J. Scott Russell. £40,000 have been voted to put her in more complete order, and she has left Holyhead and proceeded to Southampton. Our good people in Portland (Maine) will feel much disappointed at this result, as they had made great preparations for her reception.

At a recent meeting of the Liverpool (England) Polytechnic Society, some samples of ornamented wood were submitted for inspection, and the process by which the effects produced was described. The veneers and boards submitted to the process were fastened down on a solid bed, after which an engraved roller, heated to a temperature suited to the quality of the wood, was passed over it, and the pattern was burnt in. The surface was afterwards planed smooth, varnished and polished, and the effect is said to be beautiful. Every waved line and pattern desired can thus be secured in wood in a superior manner to mere staining with different dyes.

The cotton manufacturing trades are very active at present; and at Oldham (England) the wages of the spinners have advanced 10 per cent; 40 companies have given such an advance.

The builders' strike in London has nearly terminated by exhaustion of the operatives, leaving a very bitter feeling existing between all parties. This strike has been the cause of much suffering on the part of the workmen, and should afford a useful lesson to all trades' unions.

The metal trade is not very active at present. Pig iron is dull, and tin is somewhat lower in price than it was two weeks ago. Railroad iron has fallen somewhat, but the difference from former quotations in our table is not worth recording, because, although the demand for the metals has fallen, no sales are forced on buyers.

New York Markets.

CANDLES.—Sperm, city, 38c. a 40c. per lb.; sperm, patent, 50c.; wax, paraffine, 50c.; adamantine, city, 18½c. a 21c.; stearic, 27 a 28c.

COAL.—Anthracite, $4.50; Liverpool orrel, $9; cannel, $4.50.

COPPER.—Refined ingots, 22½c. a 23c. per lb.; sheathing, 26c.; Taunton yellow metal, 20c.

CORDAGE.—Manilla, American made, 8¼c. per lb.; Rope, Russia hemp, 12c.

COTTON.—Ordinary, 8¼c. a 8¾c.; good ordinary, 9¼c. a 10c.; middling, 11⅜c. a 11⅞c.; good middling, 11⅞c. a 12⅜c.; middling fair, 12⅜c. a 13¼c.

DOMESTIC GOODS.—Shirtings, bleached, 26 a 32 inch per yard 6c. a 8c.; shirtings, brown, 30 inch per yard, c. a7⅛c.; shirtings, bleached, 30 a34 inch per yard, 7 a 8¾c.; sheetings, brown, 36 a 37 inch per yard 5¼ a 8¾c.; sheetings bleached, 36 inch per yard, 7¼ a 15c.; calicoes, 6c. a 11c.; drillings, bleached, 30 inch per yard 8¼ a 10c.; cloths, all wool, $1.50 a $2.50; cloths, cotton warp, 85c. a $1.37; cassimeres, 85c. a $1.37½; satinets, 30c. a 63c.; flannels, 15c. a 30c.; Canton flannels, brown, 8¼c. a 13c.

FLOUR.—State, superfine brands, $4.90 a $5; Ohio common brands, $5 a $5.15; Ohio, fair extra, $5.50 a $5.65; Michigan, Indiana, Wisconsin, &c., $5.25 a $5.35; Genesee, fancy brands, $5.20 a $5.40; Genesee, extra brands, $5.50 a $7.50; Missouri, $5 a $7.50; Canada, $5.25 a $5.25; Virginia, $5.50 a $7.25; rye flour, fine, $3.75 a $3.90; corn meal, $4.05 a $4.50.

HEMP.—American undressed, $140 a $150; dressed, from $160 a $200. Jute, $87 a $90. Italian, $275. Russian clean, $190 per tun. Manilla, 6¼c. per lb.

INDIA-RUBBER.—Para, fine, 70c. per lb.; East India, 50c. a 52c.

INDIGO.—Bengal, $1 a $1.55 per lb.; Madras, 75c. a 95c.; Manilla, 60c. a $1.15; Guatemala, $1 a $1.15.

IRON.—Pig, Scotch, per tun, $23.50 a $24; Bar, Swedes, ordinary sizes, $37 $39; Bar, English, common, $13 a $14; Sheet, Russia, first quality, per lb., 11¼c. a 11½c.; Sheet, English, single, double and treble, 3 1-16c. a 3⅞c.; Anthracite pig, $24 per tun.

IVORY—Per lb., $1.25 a $1.80.

LATHS.—Eastern, per M., $2.10 a $2.15.

LEAD.—Galena, $5.75 per 100 lbs.; German and English refined, $5.60; bar, sheet and pipe, 5¾c. a 6c. per lb.

LEATHER.—Oak slaughter, light, 31c. a 32c. per lb.; Oak, medium, 31c. a 33c.; Oak, heavy, 30c. a 31c.; Oak, Ohio 29c. a 21c.; Hemlock, heavy, California, 20½c. a 21½c.; Hemlock, buff, 15c. a 18c.; Cordovan, 59c. a 60c.; Morocco, per dozen, $18 to $20.; Patent enameled, 16c. a 17c. per foot, light Sheep, morocco finish, $7.50 a $8.50 per dozen.; Calf-skins, oak, 57c. a 60c.; Hemlock, 56c. a 60c.; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c.

LIME.—Rockland, 80c. per bbl.

LUMBER.—Timber, white pine, per M feet, $17.50; Timber, yellow pine, $35 a $30; Timber, oak, $13 a $28; Timber, eastern pine and spruce, 13 a $15; White Pine, clear, $35 a $40; White Pine, select, $25 a $30; White Pine, box, $14 a $18; White Pine, flooring, 1¼ inch dressed, tongued and grooved, $24.50 a $25; Yellow Pine, flooring, 1¼ inch, dressed, tongued and grooved, $29 a $32; White Pine, Albany boards, dressed, tongued andgrooved, $20 a $21; Black Walnut, good, $45; Black Walnut, 2d quality, $30; Cherry, good, $45; White Wood, chair plank, $45; White Wood, 1 inch, $23 a $25; Spruce Flooring, 1¼ inch, dressed, tongued and grooved, each, 22c.a 24c.; Spruce Boards, 15c. a 17c.; Hemlock Boards, 12½c. a 14c.. Hemlock wall strips, 10c. a 11c.; Shingles, cedar, per M, $28 a $35; Shingles, cypress, $12 a $25; Staves, W. O. pipe, light, $55 a $58; Staves, white oak, pipe, heavy, $75 a $90; Staves, white oak, pipe, culls, $30 a $35; Staves, do. hhd., heavy, $70; Staves, do. bbl. light, $30 a $35; Staves, do. bbl. culls, $30; Mahogany—Duty, 8 per cent. ad. val. —St. Domingo, fine crotches, per foot, 35c. a 45c.; St. Domingo, ordinary do., 20c. a 25c.; Honduras, fine, 12½c. a 15c.; Mexican, 13c. a 15c.

NAILS.—Cut at 3¼c. a 3¾c. per lb. American clinch sell in lots, as wanted, at 5c. a 6c.; wrought foreign, 3¾c. a 3½c.; American horse-shoe, 14½c.

OILS.—Linseed, city made, 56c. per gallon; linseed, English, 56c.; whale, bleached winter, 59c. a 60c.; whale, bleached Full, 58c.; sperm, crude, $1.35; sperm, unbleached winter, $1.45; lard oil, No. 1 winter, 90c. a 95c.; refined rosin, 30c. a 40c.; camphene, 46c. a 47c.; fluid, 53c. a 55c.

PAINTS.—Litharge, American, 7c. per lb.; lead, red, American, 7c.; lead, white, American. pure, in oil, 8c.; lead, white, American, pure. dry, 7¼c.; zinc, white, American, dry, No. 1, 5c.; zinc, white, French, dry, 7½c.; zinc, white, French, in oil, 9½c.; ochre, ground in oil, 4c a 6c; Spanish brown, ground in oil, 4c.; Paris white, American, 75c. a 90c. per 100 lbs.; vermillion, Chinese, $1.12½ a $1.22; Venetian red. N. C., $1.75 a $2.31¼ per cwt.; chalk, cash, $4.75 per tun.

PLASTER-OF-PARIS.—Blue Nova Scotia, $2.75 a $2.87½ per tun; white Nova Scotia, $3; calcined, $1.20 per bbl.

RESIN.—Common, $1.55 per 310 lbs.; strained, No. 2, &c., $1.60 a $2; No. 1, per 280 lbs. $2.25 a $3.50; white, $3.75 a $4.50; pale. $4.50 a $5.50.

SPELTER plates, 5c. a 5¼c. per lb.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5½c.

TALLOW.—American prime, 11c. per lb.

TIN.—Banca, 32c.; Straits, 30½c.; plates, $7.25 a $8.50 per box.

TURPENTINE.—Crude, $3.62½ per 280 lbs.; spirits, turpentine, 46c per gallon.

WOOL.—American, Saxony fleece, 50c. a 55c. per lb.; American full blood merino, 46c. a 48c.; extra, pulled, 45c. a 50c.; superfine, pulled, 37c. a 41c.; California, fine, unwashed, 24c. a 32c.; California. common, unwashed, 13c. a 18c.; Mexican, unwashed, 11c. a 14c.

ZINC.—Sheets, 7¼c. a 7½c. per lb.

The foregoing rates indicate the state of the New York markets up to November 17th.

Our iron market is dull; not much doing, except in Scotch pig for castings. A complaint has been made to us by, some of our molders, to the effect that, two years ago, some American brands were at least equal, if not superior, to the Scotch pig, but they have depreciated in quality, and, as a consequence, we have have to fall back upon the foreign article. This should not be so.

There has been improved sales of leather during the past two weeks, although prices do not change. The book-binding trade seems to be somewhat active, as there has been a good demand for book leather and very good sales of skins to be tanned for such purposes.

At a recent meeting of the cotton buyers and cotton brokers of New Orleans, to devise means to redress certain abuses and grievances existing in the trade, resolutions were passed discountenancing the practice of factors offering for sale dusty and sandy parcels of cotton along with other parcels free from such defects, declaring all such cottons unmerchantable.

The steamship *North Star*, of this city, which has been out on her voyage to Panama far beyond her time, is reported safe. Great fears were entertained that she had become disabled, and had met the fate of the *Central America* in the Gulf of Mexico. As she had nearly 1,000 passengers on board, the deep anxiety and fears entertained for her fate have now given place to great rejoicing. It seems that she had been caught on one of the West India Keys and was detained several days, but got off, without damage or loss of life, by throwing coal overboard to lighten her.

WEEKLY SUMMARY OF INVENTIONS

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page.

MACHINE FOR RABBETING WOODEN SOLES FOR SHOES.

This invention relates to improvements in machinery for forming a rebate of a suitable character around the edge of the wooden sole, in which the edges of the upper of the shoe are nailed for giving strength and durability to the shoe making it imperious to water, and for giving to the shoe a neat appearance when finished. It consist in a novel guide rest in connection with a pressure roller and feed wheel for keeping the wooden sole in its proper position with respect to the cutters, during the operation of forming the rebate. It further consists in combining with rotary cutters a fixed tool, which shall precede said cutters and prevent the edge of the wood from splintering as the cutters perform their work and the various curves of the sole are presented to them.

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This contrivance is the invention of John Kimball, of Boston, Mass.

CLASPS FOR SKIRT HOOPS.

The object of this invention is to dispense with much of the manupulation hitherto required in the manufacture of the clasps, so that the same, at a certain stage of manufacture, may be fed much more expeditiously than formerly, to the swaging or raising machinery, and the latter enabled to be constructed or devised so as to work rapidly, commensurate with the speed of the feed, thereby expediting in a very great degree the process of manufacture. The invention consists in perforating the metal strips from which the clasps are formed in such a way that the waste pieces, or "scraps "as they are technically termed, will be cut out from the strips, leaving the "blanks" attached thereto, so that the latter may be fed continually and rapidily to the swaging and raising machinery, and while attached to the strips, struck up or swaged in proper form and then detached therefrom. The assignees of this patent are Wallace & Son, of Ansonia, Conn.

PRINTING FLOOR OIL CLOTHS.

The object of this invention is to print floor cloths of various designs in imitation of wood technically termed "graining," and also in imitation of marble or any substance or material which has a veined, variegated or clouded surface similar to many species of woods and and marbles. The invention consists in a novel way of charging the blocks with color, so that the latter will be distributed or so disposed on the face of the block that it will be transferred under suitable pressure of the block direct to the cloth, so as to produce the desired effect. This result is obtained by covering the bed or cushion with a suitable quantity of color, and by means of a "comb" or other convenient tool or implement scratching or "graining the surface of the pad or cushion in a manner similar to that done by painters in imitating different woods, marbles, &c; the pad or cushion thus treated leaving an ornamented surface of color which is transferred to the block as the latter is pressed on it, and said color under the pressure of the block transferred to the cloth. This improvement was designed by James Albro, of Elizabeth, N. J.

DOUBLE PROPELLER.

The object of this invention is to combine two screw propellers in such a manner that the water is prevented assuming a rotary motion. This object is obtained by employing two propellers, one with a right-handed and the other with a left-handed thread on parallel shafts, and so close together that the plates of one propeller gear into the plates of the other. By these gears the effect of the screws in propelling the vessel is considerably increased. The credit of this invention is due to Daniel Hughes, of Rochester, N. Y.

APPARATUS FOR TEMPERING STEEL OR WIRE.

In the process of tempering crinoline steel or wire, now in general use, the material passes continuously through a furnace, thence through a hardening bath of cold water, and thence to a tempering bath of hot oil, and it is desirable that every part of it should enter the bath at a certain heat. Now as the fire varies in intensity from frequent supplies of fresh fuel and other causes, it becomes very desirable, if the machinery is driven by steam or other power, to have some convenient and speedy method of varying the rate at which the material passes through the furnace. This invention consists in combining the drum by which the steel ribbon or wire is drawn through the fire, with the driving or counter shaft from which it receives motion, by means of a pair of cone pulleys or a belt, one or other of which is capable of being shifted to change the speed of the drum at pleasure, according to the condition of the fire. This invention was designed by William Darker, Jr., of West Philadelphia, Pa, and has been assigned to J. B. Thompson, of Philadelphia.

POUNCING HAT-BODIES.

In the manufacture of felt hats, the hat-bodies are smoothed by the application of sand-paper applied to the bodies, while the same are rotated; this operation, technically termed "pouncing," has been hitherto done after the hat-bodies have been brought to the hat-shape with flat-irons. The object of the present invention is to pounce the hat-bodies while in the conical form, or, in the state as they are received from the hardening machines; and it consists in the use of convex and concave cones, rotated at a high velocity, and used in connection with a current of air, whereby the desired work is performed in an expeditious and perfect manner. The inventor of this device is W. H. Tupper, of New York. One half of this patent is assigned to Thomas J. Hall, of this city.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING NOVEMBER 15, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

26,075.—James Albro, of Elizabeth, N. J., for an Improved Method of Printing Floor Cloths:

I claim the production of grained or variegated designs upon oil-cloth by applying the printing-blocks to cushions or pads upon which the colors have been previously "grained" or "combed," as herein set forth.

26,076.—Wm. H. Arnold, of Washington, D. C., for an Improvement in Breech-loading Fire-arms:

I claim, first, The combination of the cup-lever, L, shackle piece, C, pin, e, and grooves, i, with the breech piston, P, for operating the same, substantially as described.

Second, The combination of slide piece, k, joined as described, with the pin, a, and hammer, H, operating substantially as and for the purpose set forth.

Third, The cavity, m, in the piston, P, for the reception of the the rear projecting tail-piece of the projectile, as set forth.

26,077.—J. M. Baird, of Wheeling, Va., and Levi F. Smith, of Stonington, Conn., for an Improved Reclining Chair:

We claim, first, The combination and arrangement of the oscillating pedestal, A, vertical lever, B, the sliding seat frame, C, and stand, D, substantially as and for the purpose described.

Second, We claim, in combination with the fall, L, the vibrating foot board, P, the oscillating bars, H, and pitman, F, or their equivalents, operating in the manner and for the purposes described.

26,078,—Wm. H. Baker, of Tamaqua, Pa., for an Improvement in Mechanical Movements:

I claim the drum, B, placed loosely on the shaft, C, and having ropes or chains, l m, and a weight or weights attached to it as shown, in connection with the toothed spring, L, toothed wheel, E, train of wheels, i, fly-wheel, G, and cam, H, fitted between the friction-rollers, j, of the shaft, I, the whole being combined and arranged to operate as and for the purpose set forth.

[The object of this invention is to obtain a simple mechanism for applying the power of a weight to a reciprocating driving-shaft. The invention is more especially designed for light machinery, such as churns, washing-machines, &c., and saves the labor required by the manual operation of them.]

26,079.—Wm. C. Bamberger, of Washington, D. C., for an Improved Gage for Iron Axles:

I claim an axle gage constructed and operated substantially in the manner described.

26,080.—Jacob W. Banta, of Buffalo, N. Y., for an Improvement in Ship-building:

I claim extending the planking upon both sides of the bow, and uniting their contiguous ends forward of the dead wood, the planking and dead wood being chamfered to admit of such extension and union, substantially as described.

26,081.—James Bidwell, of New York City, for an Improvement in Burr Cylinders:

I claim securing the toothed plate, D, in place by providing them with projections or recesses to fit to corresponding recesses or projections provided in or on the interposed packing-rings fitting to the body of the cylinder, substantially as described.

[The burr cylinders heretofore commonly used have their teeth formed on flat rings of steel plate. The body of the cylinder having been turned truly in a lathe, has these rings simply slipped on, with rings, termed packing-rings, arranged between them, and the whole of the rings are secured in place lengthwise of the cylinder by means of heads, one or both of which are movable. This method of constructing and applying the teeth does not admit of their being hardened or tempered, as it has not been found possible to preserve the form of the rings in the hardening process, and moreover it entails a great waste of material. The object of this invention is so to construct the teeth as to obviate, as far as practicable, the waste of metal, in their manufacture, and to permit of their being hardened and tempered, and yet to so apply them to the cylinder as to perfectly secure them thereto; and to this end the invention consists in constructing the teeth on plates which constitute segments of a ring, and securing such plates to the packing-rings by means of projections on the one and recesses in the other.]

26,082.—Aaron Bowers, Jacob H. Griggs and John Wilson, of Monmouth, Ill., for an Improvement in Mole Plows:

We claim the combination of the peculiarly-constructed mole, A, with the scrapers, a a, and presser, D, arranged and operating in relation to each other as and for the purpose set forth.

26,083.—Adolful Brass, of Newark, N. J., for an Improved Tool for Cutting Corks:

I claim a cutter consisting of two curved blades, z z, two spring or hinged arms, x x, and a sliding-ring, c', with extensions, substantially as and for the purposes set forth.

[The principal advantage of this machine lays in the cutter which is so arranged that it cuts cylindrical and tapering corks. In cutting tapering corks the cutter begins on the larger end of the corks, whereby the same become smoother than when cut from the small end up to the large one.]

26,084.—Isaac A. Brownell, of Providence, R. I., for an Improvement in Machine for Packing Starch, &c.:

I claim the tunnel, T, as constructed for the purpose, substantially as described.

Second, I claim attaching the cans, i i, to upright strips of wood or metal, which receive and transmit to the said cans the motions which reduce in bulk the commodity placed therein.

Third, The wheel, F, or its equivalent for holding and carrying the bocks, h h, in combination with the cam-wheel, G, or its equivalent, and the studs, l l, &c., for imparting the motions which reduce the commodity in bulk, and also the intermittently-rotary motion to the wheel, F, for the purpose set forth.

Fourth, I claim the arrangement of the foot-lever, u, and the rod, v, and the punch, S, with the rod and plate, j, for the purposes specified. I also claim, in combination with the punch, S, the pawl, w, rod, y, and sliding-hub, x, for liberating the wheel, F, at the proper time.

Fifth, I claim the rail, a a, and the studs, r r, &c., with the stop, O, for withholding, in the manner and for the purpose specified.

26,085.—Joseph Bullock, of Cohoes, N. Y., for an Improvement in Knitting-machines:

I claim the employment, in combination with such a circular series of stationary needles of a series of lever-like jacks, F, applied substantially as described, and having a movement between the needles in a direction radial to the center of the machine, as described, but no rotary motion.

[This invention consists in the employment in a circular knitting-machine, in combination with a stationary series of needles pointing towards the center of the machine, of a series of jacks having only a movement between the needles in a direction radial to the center of the machine, for the purpose of "landing" the stitches over the beards of the needles.]

26,036.—George T. Bushnell, of Birmingham, Conn., for an Improved Martingale Ring:

I claim, as a new article of manufacture, a martingale ring whose exterior edge is thinner than the interior, in combination with an exterior band, whose edges extend down upon the sides of the ring, forming a hollow or corrugated band on its surface, substantially as described, for the purposes as aforesaid.

26,087.—John T. Butler, of Natchez, Miss., for an Improvement in Fastening Metal Hoops on Cotton Bales:

I claim the combination of the buckle frame, A, when made without any opening in the border of it, with the hooks, C C', when the latter are received through the former and held in place by the pressure of the bale against them, substantially as described and represented.

26,088.—Lysander Button and Robert Blake, of Waterford, N. Y., for an Improvement in Nozzles for Fire-engines:

We claim the removable ring, B, constructed and combined with the adjutage, substantially as set forth.

26,089.—Wm. L. Carter, of Marietta, Pa., for an Improved Ore-washer:

I claim a double conical-shaped vessel, provided with teeth or cutters inside at the end where the ore is received, and the grinders, G, with the means described for supporting and adjusting the same, substantially as specified.

26,090.—Cyrus Chambers, Jr., of Philadelphia, Pa., for an Improvement in Machines for Folding Paper:

I claim, first, So arranging the drop-roller that it shall co-operate with one of the feeding-rollers in feeding in the sheet.

Second, Forming grooves in the folding-rollers for the reception of the adjustable guides, as described.

Third, The combination of the carrying-roller with the folding-roller for carrying in the sheet.

Fourth, Giving the curved bars a projection beyond the surface of the rollers, for the purpose of raising or bearing off the sheet from the folding-roller, substantially in the manner described.

Fifth, Moving the folding-knife in an arc around one of the folding-rollers, as and for the purpose specified.

Sixth, Placing the center of the arc in which the folding-knife moves, near or within the periphery of the roller around which it moves, substantially as and for the purpose set forth.

Seventh, Corrugating the sheet as it passes from one folding-mechanism to a position to be acted upon by the next, for the purpose described.

Eighth, Turning or conducting the paper by means of the bent bars, 13 or 22, or their equivalents, substantially in the manner specified.

Ninth, The combination of the bent bars with the straight bars and adjustable stop, arranged substantially in the manner described.

Tenth, The combination of the bent bars with the tapes and stop, for the purpose specified.

Eleventh, The oscillating packer or plunger, R, having its center of motion below the point of contact with the folded sheets, as set forth.

Twelfth, The yielding catches for preventing the return of the packed sheets, constructed and operating substantially as described.

Thirteenth, Making one or more notches in the plunger for cleaning the yielding catches, as set forth and shown.

26,091.—George E. Chenoweth, of Baltimore, Md., for an Improvement in Harvesters:

I claim the described arrangement and combination of the finger-bar and main frame, whereby the bar can be folded forwards to the side of the machine with its front downwards, so that the platform can remain attached to the bar, and occupy a vertical plane therewith when folded to this position, all as described and represented.

26,092.—Philip L. Clow, of Cohoes, N. Y. for an Improved Churn:

I claim, first, Hanging the outer parts, a a a' a', of two contrarily-revolving dashers, B B', to the central portions, c c', by hinges, d, in the manner and for the purposes set forth.

Second, The arrangement of the air-pump, E, and water-reservoir, F, with the revolving-dashers, B B', and cream vessel, G, as and for the purpose described.

26,093.—Aaron L. Cornell, of New York City, for an Improved Rotary Churn:

I claim the arrangement of the rotating-shafts armed with the concave or recessed crags or dashers within the two concave or half-cylinder chambers, placed back to back, as described.

26,094.—H. Davidson, of the United States Navy, for an Improved Apparatus for Working Ships' Boats:

I claim the boat apparatus consisting of the rod, the attaching and detaching hooks, constructed and operating substantially as specified.

26,095.—Thomas H. Dodge, of Washington, D. C., for an Improvement in Mowing-machines:

I claim, first, The arrangement and combination of the levers, standards and cords, i i, or their equivalents, with shoe, C, whereby the driver, from his seat on the machine, can elevate either end of the finger-bar independently of the other, or the entire bar, substantially as described for the purpose specified.

Second, I claim the combination of the cutting-apparatus with the main frame and mechanism represented in Figs. 2 and 16, or its equivalent, so constructed and arranged that the driver can, without leaving his seat on the machine, fold up and unfold the finger-bar without taking hold of it with his hand, substantially as and for the purpose stated.

Third, I claim the combination and arrangement of the levers, G G', with the driver's seat, E, and cord or chain, h', whereby the driver may, when necessary, employ both his hands and his feet, together with the power of the team, to raise the finger-bar and cutting-apparatus substantially as set forth.

Fourth, I claim so combining mechanism with the machine as that the driver can employ the power of the team to assist to elevate the finger-bar and cutting-apparatus at pleasure, without changing

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the horizontal position of the main frame, substantially as described.

Fifth, I claim, in a reaping and mowing-machine, the folding guard, F, and rein-hitch, h, in combination with the driver's seat, substantially as and for the purposes set forth.

Sixth, I claim the flexible or adjustable draft connection, b' or X, to which the team is attached, in combination with the coupling-arm, a, and shoe, C, substantially as and for the purposes set forth.

Seventh, I claim the spiral cutters, k, when constructed and arranged as shown in Fig. 11, and operating substantially as and for the purposes set forth.

Eighth, I claim hinging the track-clearer to the extension piece, j', or its equivalent, by means of the cranks, j j, for the purposes described.

Ninth, I claim so constructing the track-clearer that its weight may be adjusted in the manner and for the purposes substantially as set forth.

26,096.—Miles Earnhart, of Cold Water, Miss., for an Improvement in Cotton-scrapers:

I claim the arrangement and combination of the double adjustments of the mold-board, E, with the stock, C, and rigid supporting-brace, G, substantially as and for the purpose specified.

26,097.—Moses G. Farmer, of Salem, Mass., for an Improvement in Telegraphic Machines:

I claim the use of a key or circuit-breaker, which shall close one circuit before or at the same time that it opens another, in connection with an electro-magnet with two sets of helices operating on one and the same armature-lever, or two separate electro-magnets operating upon one and the same armature-lever, for the purpose of transmitting two messages simultaneously upon a single wire.

26,098.—Wm. Frost, of Amenia, N. Y., for an Improved Milk Can:

I claim a milk can provided with tinned-iron loops, B, with their ends connected together by rivets, b, and solder, a, either or both, and secured on the can by solder, to form an improved article of manufacture as set forth.

[The object of this invention is to render milk cans far more durable than hitherto, so that they will be competent to withstand, in a very great degree, the wear and tear consequent on transportation. Milk is conveyed to cities in these cans, and mostly on railroads; and the cans are stored or packed closely together in cars, and soon are rendered useless by abrasion and the bruises received by rough handling. In order to overcome this difficulty, the inventor loops the cans in a peculiar manner.]

26,099.—Rollin Germain, of Buffalo, N. Y., for an Improvement in the Construction of Ships and other Navigable Vessels:

I claim, first, Vessels for navigation when the bow and stern sections shall taper uniformly, and the vessel below its water-lines be of the form and model substantially as described, and when the relative proportions as to length, breadth of beam and draught of water, shall be such that, if a right line be drawn longitudinally through the middle, commencing at the water-line at the bow and terminating at the water-line at the stern (when the vessel is loaded), and another line be drawn at right angles to said line along the water-surface, from the water-line on one side to the water-line on the other side, at the middle of the part of the vessel where a cross-section below the water-line is greatest, and from every point in this last-described line right lines be drawn to each end of the first-described line, the average of all the angles made by these last lines with the first-described line shall not exceed two degrees.

Second, The combination of the fin-like projection, V, with a vessel constructed, below its water-lines, substantially as described.

Third, The combination of the overhanging deck with a vessel constructed, below its water-lines, substantially as described.

Fourth, Constructing the pilot-house and smoke-stacks (separately) in respect to their forward and rear parts, in a tapering or wedge-like form, substantially as described.

Fifth, The combination of the notched-plates, C C, the iron knee, D, and rivets, E, with a vessel constructed substantially as described for the purposes set forth.

26,100.—James Giles, of Dryden, N. Y., and C. B. Tompkins, of Ulysses, N. Y., for an Improvement in Cylinders for Smoothing Walks, &c.:

We claim making cylinders for rollers and other purposes, with grooved metal flanges, into which wood staves are fitted, which form the rolling-surface, substantially as described and for the purposes specified.

Also, the mode of making and applying cross-bars between rollers, when two or more cylinders are required for smoothing surfaces, as described.

26,101.—George Hamel, of Abington, Pa., for an Improvement in Apparatus for Starting City Railroad Horse Cars:

I claim the relative arrangement of the levers, E E, the pawls, F F, in combination with the rest pins, u, and inclined planes, u' u', the draw-bar, D, in combination with the inclined pieces, s s, and the staying-pins, p and q, or their equivalents, for holding and releasing the draw-bar, D; the same being constructed and arranged to operate substantially in the manner and for the purposes specified and described.

I also claim, in combination with the said draw-bar, D, the devices, H I K L and M; the same being arranged so as to be operated by the cam, N, for their re-adjustment, substantially in the manner set forth and described.

26,102.—Jacob E. Hardenbergh, of Fultonville, N. Y., for an Improvement in Potato-harvesters:

I claim, first, The employment or use of an adjustable share, N, in connection with the rotary screen, P, and with or without the discharging-device, Q; the parts being applied to a mounted frame, and arranged to operate substantially as and for the purpose set forth.

Second, The rotary discharging-device, Q, placed eccentrically on the screen, P, kept in proper relative position therewith by the plate, R, and rotated from the screen, P, by the projection, q, substantially as described.

Third, The combination of the share, N, rotary screen, P, and discharging-device, Q, when attached to a mounted frame, A, and arranged substantially as shown, so that the screen and the discharging-device may be adjusted independently of the share, and the discharging-device, Q, rotated by the screen, P, and kept in an eccentric position thereon for the purpose specified.

[This invention consists in the use of an adjustable share, rotary screen and a rotary discharging-device, attached to a mounted frame, whereby the desired work, to wit, the digging of potatoes and other roots, may be performed very expeditiously, and in a perfect and thorough manner.]

26,103.—Albert H Hook, of New York City, for an Improvement in Machines for Grinding Glass:

I claim the combination of the inclined carriage, c, and cylinder, i, arranged and operated in the manner and for the purposes specified.

26,104.—Elisha G. Hopkins, of Penn Yan, N. Y., for an Improved Bedstead-fastening:

I claim the construction and arrangement of the parts C D E and F, substantially as specified and for the purpose set forth.

26,105.—M. G. Hubbard, of New York City, for an Improvement in Harvesters:

I claim the universal joint, O, in the reel in which the arms and wings are pivoted, or flexible and yielding, substantially as specified.

I also claim the combination of the flexible reel, G, with the flexible platform, D, substantially in the manner and for the purposes specified.

I also claim the outer reel-arm, S, in combination with the flexible reel and platform, as described.

26,106.—Daniel Hughes, of Rochester, N. Y., for an Improved Propeller:

I claim the arrangement of the spiral screw-propellers, C C', so that their blades shall work nearly in contact, and thus present a broad, unbroken, resisting-surface, substantially as and for the purposes shown and described.

26,107.—Wm. J. Innis, of Providence, R. I., for an Improved Belt-awl and Punch:

I claim the combination of the punch, awl and spring handle, substantially as described.

26,108.—Enoch Jacobs, of Cincinnati, Ohio, for an Improved Fastening for Jail Doors:

I claim, first, Making the casings of heavy iron doors of double angle iron, substantially as described.

Second, Fastening iron doors by swinging bars, working in the outside cavity of the double angle iron-casing substantially in the manner and for the purpose set forth.

26,109.—Thomas A. Jebb, of Buffalo, N. Y., for an Improved Churn:

I claim the arrangement of the short dash-blades, H, and long dash-blade, H2, relatively to each other and to the segmental stave, B, so that the short dash-blades will revolve within, and the long dash-blade under, the lower beveled end of the segmental stave, substantially as set forth.

26,110.—Arthur E. Jerome, of Monroeville, Ohio, for an Improvement in Seeding-harrows:

I claim, first, Making the axis on which the harrows rotate hollow, and in the form of a drill-tooth, substantially as and for the purposes set forth.

Second, Combining a corn-planter or a broadcast-sower with the harrows, substantially as and for the purposes set forth.

26,111.—W. T. Jones, of Joliet, Ill., for an Improvement in Plows:

I claim the attaching of the mold-board, E, land-side, F, and share, G, to the standard, C, by means of a joint or hinge, the plates or leaves, e f, of which are provided with screws, and arranged substantially as and for the purpose set forth.

I also claim constructing the standard, C, with a forked upper end, in connection with the rod, D, lug, h*, and flanch, f, arranged substantially as shown, to admit of the proper attachment of the beam and handles to the plow.

[The object of this invention is to obt in a plow that may be readily adapted for one, two, or more horses, and the draft of the plow regulated according to the nature of the soil and the capacity of the team. The invention consists in attaching the land-side and mold-board to the standard by means of a hinge joint, so arranged as to admit of the adjustment of the mold-board, land-side and share, relatively with the line of draft, that a furrow slice of greater or less width may be taken from the land, as circumstances may require.]

26,112.—J. G. Kappner, of New York City, for an Improved Billiard Table:

I claim the combination, with the cushion-rail, B, of the circular guide-plate, C, pivoted cross-arm, E, and hook, c, as and for the purpose shown and described.

[This neat and simple contrivance obviates the difficulty which constantly occurs with chalk cups, as ordinarily attached to billiard tables. It is so arranged that it cannot come off, and all its parts are made of cast-iron, rendering the whole device strong, durable and cheap.]

26,113.—John Kimball, of Boston, Mass., for an Improved Machine for Rabbeting Wooden Soles for Shoes:

I claim, first, The combination of the convex guide-rest, G, with the pressure-roller, J, and feed-roller, E, when arranged substantially as and for the purpose set forth.

Second, I claim, in combination with the rotary cutters and feed-rollers, E, the fixed tool, P, when used in the manner and for the purposes set forth.

26,114.—Wm. A. Kirby, of Buffalo, N. Y., for an Improvement in Harvesters:

I claim locating the raker's seat over the open space at the side of the platform, so that the delivery may be at any point along the whole side of said platform that the raker may desire, substantially as described and represented.

26,115.—Wm. S. Mathews, of Meriden, Conn., for an Improved Beer Pitcher:

I claim a pitcher, A, with two strainers, F and G, one at the bottom and the other at the top of a partition, E, and otherwise constructed as specified.

[By this invention the annoyance caused by the froth mixing with the beer, or other similar liquids, when poured from a pitcher into a tumbler, so well known to all dealers and consumers of such liquids, is entirely obviated by simply placing before the spout, and extending from the top to the bottom of the pitcher, a partition furnished with two strainers, so that no more froth is allowed to escape than necessary to give to the beer in the tumbler a lively appearance, and still the pitcher can be emptied to the last drop.]

26,116.—Louis Meyer, of Columbus, Ga., for an Improved Extension Table:

I claim the beveled arms or braces, G G G' G', central cross-piece, B, and stops, b b b b, on the brace arms, when they are all combined and arranged as and for the purposes set forth.

[This invention consists in the employment of beveled or tapering arms to which the leaves of the table are fixed, which serve for braces or supports for said leaves when extended, and which rest upon the frame of the table in suitable guides and press against a central cross strip, which strip serves as a central support for the top of the table when the leaves are drawn out, the whole being so arranged that as the leaves are drawn out from under the table top they will be elevated on a level with said top, the whole forming a neat and strong table, which is simple and easily operated.]

26,117.—David Mumma, Jr., of Harrisburgh, Pa., for an Improvement in the Mode of Operating Brakes on Railroad Cars:

I claim the employment of the movable plate, E, or its equivalent, provided with a shoe, x, when in combination with a friction wheel, n, a lever, D, and wheel, a, all so arranged that friction from said shoe and plate may be applied in the manner and for the purposes substantially as set forth.

I claim the arrangement of the brake chain attached to the axle, o, as described, so the said axle may be employed as a lever, for the purposes set forth.

26,118.—J. D. Otstot, of Springfield, Ohio, for an Improvement in Potato-harvesters:

I claim the arrangement and combination of the bent lever, h h, excavator, d, rotary rake, k k' k'', hopper, l l, and driving wheels, B B, substantially in the manner and for the purpose set forth.

26,119.—George F. Palmer, of Farmington, N. H., for an Improved Machine for Making Wooden Boxes:

I claim, first, The arrangement of the cutters, a b, in combination with the stationary saws, H and K, and with the adjustable saws, J and N, substantially as and for the purpose specified.

Second, The employment of the expanding sliding platforms, I and M, arranged in combination with the saws, H K J and N, substantially as and for the purpose specified.

[This machine prepares the boards for boxes of different sizes. It cuts the tongue and grooves into the edges of the boards, squares the same, and cuts them of the proper width and length, which is determined by expanding platforms.]

26,120.—John Patton, of Arcadia, Ind., for an Improved Washing-machine:

I claim the spiral springs, J, clamp, I, the hook, K, in combination with the groove in the cylinder, C, poles, H, chains, F, cross-piece, G, rollers, D, board, B, compound wringer and rinser, O and O', cylinder, C, when operated as described.

26,121.—Isaac N Pyle, of Decatur, Ind., for an Improvement in Cultivators:

I claim the arrangement and combination of the curved pivoted wing rods, A A, curved adjustable central rod, C, looped sockets, F, vertical movable standards, J, rods, M, braces, L, and handles, E, as and for the purpose shown and described.

[With this device the wings of the cultivator can be adjusted laterally by moving the handles longitudinally. The brace rods and standards, with the shovels, are all moved simultaneously.]

26,122.—J. R. Perry, of Port Clinton, Pa., for an Improved Machine for Cutting Tenons:

I claim, first, The combination of the right and left hand screw, L, with the cutter-heads, K, in the manner and for the purpose set forth.

Second, Constructing the cutter bits with lugs to receive the shoulder bits, as specified.

26,123.—John Pyne and Washington Barr, of Harrisburgh, Pa., for an Improved Egg-beater or Ice-cream Freezer:

We claim the ice-cream freezer or egg-beater, the bottom having corrugated perforated circles, in which the shaft and wires of the dasher revolve, as and for the purposes set forth and described.

26,124.—George M. Ransom, of the United States Navy, for an Improvement in Apparatus for Elevating Cannon:

I claim the application of trunnions and bearings, or equivalents, to the nut, in combination with jointing or hinging the upper end of the upper screw to the cascable, or to a saddle attached to or supporting the cascable.

I also claim the combination of the cascable saddle with the elevating screw and cascable of the gun.

26,125.—John H. Redstone and Albert E. Redstone, of Indianapolis, Ind., for an Improved Lath Machine:

We claim, first, Operating the knife-plate, H H, by the sliding bar, C C, and groove or yoke, E, in combination with the roller, F, when attached to the knife-plate, H H, substantially as set forth.

Secondly, The guides, Q and Q, roller, R, slide, S S, pins, T L and L, and slots, Y O and O, when combined and operated as set forth.

26,126.—Nathan F. Rice, of New Orleans, La., for an Improvement in Bakers' Ovens:

I claim the bakery described, constructed, arranged and operating as specified, the same consisting of a series of ovens placed on different floors of a building, and heated successively by products of combustion, directed and controlled by the described combination of flues, dampers and air-chambers, arranged and co-operating as shown.

26,127.—Albert C. Richard, of Newtown, Conn., for an Improved Letter Envelope.

I claim, as a new article of manufacture, a letter envelope, having the properties fully set forth, for the purpose as described.

26,128.—George D. Sharp, of New York City, for an Improved Billiard Table Cushion:

I claim the combination of the hollow cushion with a square or slightly beveled face for the ball to impinge against, thus producing a spring of greater ductibility than other billiard table cushions have.

26,129.—S. A. Shurtleff, of North Carver, Mass., for an Improved Fore-iron for the Use of Shoemakers:

I claim the adjustable beading plate, D, applied to a stock, B, and arranged substantially as shown, to form an improved article of manufacture, for the purpose specified.

[This invention relates to a new and improved tool or implement used by shoemakers for burnishing or finishing the edges of the soles of boots and shoes, and technically termed a fore-iron. The object of the invention is to obtain an implement that may be adjusted to suit soles of varying thicknesses, and one that may be also adjusted to compensate for wear, so that the tool is not only rendered very durable but also rendered capable of very general application, answering the purpose of several of the implements usually employed.]

26,130.—E. C. Singer, of Port Lavaca, Texas, for an Improvement in Sewing-machines:

I claim the feed device, the essential features of which are the plate, l, the block, p, and the lever, m, and stop, s, operated by the grooved sliding bar, Q, arranged and constructed substantially in the manner and for the purposes set forth.

26,131.—Ferdinand M. Sofge, of Macon, Ga., for an Improved Billiard Register:

I claim the arrangement of springs, a b and c, operated by means of ylinder, A, upon tally, d, as and for the purpose described.

c I also claim, in combination with the above, the cylinder, C, in connection with the tally, 1 and 2, or any number of tallies, and springs, h, constructed and operated as and for the purpose set forth.

26,132.—W. H. Tupper, of New York City, for an Improvement in Pouncing Hat Bodies:

I claim the employment of an air blast to cleanse and hold the body, G, within the hollow cone, F, while the said body is being rotated and pounced as shown and described.

26,133.—John T. Townsend, of Brenham, Texas, for an Improvement in Plows:

I claim the arrangement and combination of the land-side, A, standard, B C, mold-board, H, share, F, braces or arms, D E I, and cross-bar, G, substantially as and for the purpose set forth.

[This invention consists in a peculiar arrangement and combination of braces, land-side, mold-board and standards, whereby said parts may be attached to iron beams, and a very durable and efficient implement obtained.]

26,134.—Wm. H. Rodgers, of New York City, for an Improvement in Machines for Inserting Eyelets:

I claim single punch, B, operated as described, in combination with the connection lever, A, cutter, D, and yielding spring guide point, F,

26,135.—Wm. T. Vose, of Newtonville, Mass., for an Improved Portable Pump:

I claim an improved pump, as constructed with a barrel and the foot-stand or rest, combined and arranged together substantially as described.

26,136.—Edward Weibe, of Brooklyn, N Y., for an Improved Mode of Advertising:

I claim the above described mode of exhibiting advertisements, when operated automatically, substantially in the manner set forth.

26,137.—Joseph A. Woodward, of Philadelphia, Pa., for an Improved Signal Bell:

I claim the lever escapement bar, L E B, constructed substantially as described, with the elliptical slot and projecting point, x x, in combination with the projecting point, x, of the hammer or striking arm, S A, the whole arranged substantially as described and for the purpose set forth.

26,138.—William Wright, of Hartford, Conn., for an Improvement in Steam Pumping Engines.

I claim, first, The application of the forked yoke inclined arms and levers, in conjunction with an independent hydraulic cylinder or engine, for working the valves of a steam-engine properly—opening and closing them, and effecting the cut-off at the proper points, and performing all the offices and obtaining all the useful results of a well regulated and effective valve gearing.

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Second, The combination of the forked frame and inclined arms for controlling and regulating the length of stroke between certain points on the faces of said planes, and graduating it between these points at the will and pleasure of the engineer, so as to reduce the clearance in the steam cylinder to a minimum.

Third, The manner in which the main valve of the hydraulic cylinder is brought into action at proper and fixed intervals, and working the steam valves of the engine independently of the forked frame and its inclined arm, should the latter part of the gearing fail, from any cause, to assist in performing their duty.

Fourth, The application of the auxilliary valve, in combination with the main valve of the hydraulic cylinder, for effecting at the proper point the opening of the steam valves instantaneously and ahead of the steam piston; or in other words, for giving the lead to the valve as effectually as an eccentric will on a crank engine, and forming a cushion for the piston at the end of the stroke, reversing the movement and holding the valves wide open until the cut-off is accomplished, substantially in the manner described.

Fifth, The mechanism for accomplishing, positively, the cut-off and insuring the closing of the valves, and in connection therewith, the method of regulating and adjusting the same to any required point of the cut-off that the beneficilll working of the engine may demand, as explained.

26,139.—Wm. Wright, of Hartford, Conn., for an Improvement in Pumps:

I claim, first, The construction of the pump by the application of an auxiliary barrel to the working or brick barrel, and connecting both barrels by a double beat valve, thus effecting a combined opening through the auxiliary and the bucket valves with a minimum lift of said valves greater than the area of the pump itself, and obviating to a great degree the frictional resistance that would be produced by passing all the water through the pump bucket valves alone, preventing all throttling, and permitting the engine to work more regularly and economically, substantially as described.

Second, The placing of one pump above the other, when made as above described and connecting both together, and passing the load of one through the working and auxiliary barrels, and the bucket and auxiliary valves of the other, and vice versa, thus allowing the engine to have complete control over the column of water, substantially as described.

26,140.—Samuel K. Zook, of New York City, for an Improved Mode of Telegraphing:

I claim the construction of the telegraphic lines of metallic conductors of a high conducting power, having the portions of the wire conductors which are between the two telegraphic extremes in the earth, or submerged in the ocean or rivers, not artificially insulated, but using the earth or water as the natural insulator of those parts, in combination with the artificially insulated portions of the wire on each or other side of the battery or batteries, in the manner and for the purposes described.

26,141.—Charles F. Bennett, of Warehouse Point, Conn., assignor to Julius H. Baker, of East Windsor, Conn., for an Improvement in Machinery for Drying Cloth:

I claim the extra adjusting vibratory arrangements, plate 2, Fig. 7, whereby the cloth can be spread and straightened on the selvage while passing over the rollers, in the manner substantially as set forth and described.

26,142.—John Butter, of Buffalo, N. Y., assignor to J. A. Saxton, of Canton, Ohio, for an Improvement in Harvesters:

I claim the combination of the shoe, L, with hinged and adjusting rods, c and N, plate, M, and cup, k, constructed, arranged and operating in relation to each other and the main frame, as and for the purposes set forth.

26,143.—Wm. Darker, Jr., of West Philadelphia, Pa., assignor to J. B. Thompson, of Philadelphia, Pa., for an Improvement in Tempering Steel Wire:

I claim combining the drum, D, by which the steel ribbon or wire is drawn through the fire and bath, with the main or counter shaft, from which it derives motion, by means of a pair of cone pulleys or belt, substantially as and for the purpose specified.

26,144.—J. H. Doolittle (assignor to Wallace & Sons), of Ansonia, Conn., for an Improvement in Making Clasps for Hoop Skirts:

I claim manufacturing metal clasps for fastening the tapes on hoop skirts, and for similar or analagous purposes, by cutting the scraps from the metal strips, A, so that the blanks, b, will be attached thereto, and while thus connected, fed to the swaging or raising device, and swaged in proper form to produce the clasps, substantially as described.

26,145.—Darius Wellington (assignor to C. Wellington), of Boston, Mass., for an Improvement in Cocks for Water-closets:

I claim the employment or use of the valve, b, and plunger, B, connected by the stem, C, placed within a suitable cylinder, A, and arranged relatively with the supply and discharge pipes, D E, to operate as and for the purpose set forth.

[The object of this invention is to dispense with the usual cistern or reservoir hitherto forming a necessary appendage to a water-closet, in order that the basin or bowl of the latter may be thoroughly cleansed and the foul pipe sealed after use. The invention consists in constructing a cock, which is attached to a pipe containing water under pressure, in such a way that, when its handle is released from the hand of the occupant of the closet and the basin been allowed to close, the cock will close gradually so as to admit, direct from the water pipe, a requisite quantity of water into the basin or bowl to seal the foul pipe.]

26,146.—Lewis White (assignor to himself and E. P. Miller), of Hartford, Conn., for an Improved Curtain Fixture:

I claim the application of the bracket and brake, E, in combination with the pulley, cord and pendant lever, K, thus forming a double brake, in the manner substantially as set forth and described.

26,147.—Wm. L. Williams (assignor to himself and Thos. J. O'Connor), of New York City, for an Improved Machine for Bundling Kindling Wood:

I claim, first, The follower, c, acting to lift a bundle of wood through a ring or opening, and separate the same from the mass of split kindling wood in the trough, b, substantially as specified.

Second, I claim the ring separator or the knife, p, arranged substantially as set forth, and acting to split or separate from the mass of kindling wood a bundle, as described and shown.

Third, I claim the combination of the follower, c, and ring separator or knife, p, in the manner and for the purposes set forth.

Fourth, I claim two or more slides, h h, with curved ends, acting against and on opposite sides of a bundle of kindling wood to compress the same previous to being secured by a wire or string, as and for the purposes specified.

Fifth, I claim the compressing levers, n n, in combination with the slides, h h, to act in compressing the bundle of wood, as set forth.

Sixth, I claim the twisting jaws or pincers, t t', fitted to receive the wire in the manner specified, so that the act of revolving said jaws to twist the wire shall first draw the wire tight, as set forth.

Seventh, I claim the weight, t, hung on the levers, m m, and acting to bring the ends of the wood level, as set forth.

26,148.—Henry C. Rice, of Worcester, Mass., administrator of the estate of John H. Hathaway, deceased, late of Milbury, Mass., for an Improvement in Rotary Engines:

I claim the combination with the cross-head, or its equivalent, which carries the abutment or cylinder head, F, of the rockshaft, I, the toggle, J L, and the vibrating arm, M, the whole applied and operating substantially as described, in combination with the guide-arms, H, for the purpose specified.

And in combination with the above mentioned rockshaft, I claim the arm, K, slide, N, lever, P, and eccentric, Q, applied substantially as described, to produce an intermittent or remittent motion of the said rockshaft, as set forth.

[This invention relates to that class of rotary engine which is the subject matter of Letters Patent of the United States, granted Nov. 13, 1855, to the aforesaid John H. Hathaway. It consists in certain means of operating the movable cylinder head or abutment, whereby the use of cams for that purpose is dispensed with, and the operation performed in a more positive and effective manner.

26,149.—Thos W. Gilmer, of Charlottsville, Va., administrator of John B. Gilmer, deceased, late of same place, for an Improvement in Type-setters and Distributors:

I claim withdrawing the type from the type-case and setting them in line in the composing stick without the aid of intermediate carrying mechanism, but by the direct application of the composing-stick to the type-case, substantially as described.

I also claim distributing the type to the type-case by the direct application of the distributing-stick to said case, substantially as described.

I also claim, in combination with the type-case, the holding dog, or its equivalent, arranged and operated substantially as described, so as to retain the type as they descend opposite the mouth of the case and release the type when the mouth of the composing-stick is in position to receive them.

I also claim arranging the type-case, substantially as described, so that, by a retrograde movement of the case, the type is discharged into the composing-stick, as described.

I also claim, in combination with the composing-stick, the spring mouth-plate to hold the type as they enter the stick.

In combination with the spring mouth-plate, I claim the lip, l, or its equivalent, arranged substantially as described, to assist in withdrawing the type from the case, and to prevent their turning or falling out of the composing stick as they are withdrawn from the case.

I claim discharging the type into the case through the bottom of the distributing-stick, substantially as described.

And I also claim, in combination with the distributing-stick, a separating and discharging mechanism to the type, arranged substantially as described, so as to separate the front type from the rear and from them into the type-case.

RE-ISSUES.

Charles G. Bloomer, of Wickford, R. I., for a Rim for Lockets. Patented April 28, 1857; re-issued Nov. 15, 1859:

I claim a rim for lockets and similar metallic cases, formed of sheet metal, in such manner that the face of the field-piece within the case and the exterior surface of the rim are both formed from the same side or surface of the original sheet metal, and that the field-piece and rim are of one piece of metal.

Charles G. Bloomer, of Wickford, R. I., for a Mode of Constructing Lockets. Patented April 28, 1857; re-issued Nov 15, 1859:

I claim the method of imparting the finished shape to case-rims of sheet or thin metal, in which the external ring and field-piece are one piece of metal, by means of dies, substantially as set forth.

Moses S. Beach, of Brooklyn, N. Y., for Machine for Wetting and Cutting Paper for Printing-presses. Patented August 25, 1857; re-issued Nov. 15, 1859:

I claim, first, The combination with the printing-machine of the mechanism described, or its equivalent, so arranged that the paper, as it passes along from the reel to be printed upon, shall be dampened, as set forth.

Second, The combination with the cylinders, C D, or their equivalents, of the adjustable rollers, E F, or their equivalents, to supply the moisture for the paper, and also to regulate the quantity of that moisture, as set forth.

Third, The combination with the printing-machine of the moisture vessels, G H, or their equivalents, as set forth.

Fourth, The combination of the cutting-knife with the dampening roll-cylinder, or its equivalent, as set forth.

Fifth, Simultaneously wetting or moistening both sides of the paper in the manner substantially as described.

Sixth, Leaving the paper dry at the point or line of cutting, substantially as described.

Seventh, The employment of a spring-pressure to project the knife in the manner substantially as shown and described.

Eighth, Retiring the knife within circumference of the cylinder, by means of the cams, R, or their equivalents, as set forth.

Ninth, Catching the knife, when retired within the circumference of the cylinder, C, retaining it while so retired, and releasing for the operating of cutting by means of the catches, e f, the springs, j, and the tripping-pins, I, or their equivalents, in the manner substantially as described.

Tenth, The employment of cylinders, C D, or their equivalents, to draw the paper from the reel, to be afterwards cut into sheets, and fed into the printing-machine, as set forth.

Eleventh, Breaking or tearing asunder any fibers of paper left uncut by the knife, by the grasp of the cylinder, M, and roller, Q, or their equivalents, as set forth.

Twelfth, Giving the conducting or guide-tapes, K, or their equivalents, a speed greater than that of the paper, as set forth.

Thirteenth, The combination of the feeding-mechanism, cutting-apparatus and the printing-machine, or their equivalents, in the said combination for feeding the paper from a roll to a printing-machine, and cutting, or partially cutting, it into sheets as it passes along to be printed, as set forth.

Thomas Blanchard of Boston, Mass., for an Improvement in Bending Wood. Patented Dec. 18, 1849; re-issued Nov. 15, 1959:

I claim my improved method of bending wood, substantially as decribed.

ADDITIONAL IMPROVEMENT.

William C Allison, of Philadelphia, Pa. (assignor to himself and Jno. Murphy, of said Philadelphia, Pa.), for an Apparatus for Watering and Sweeping Railroads. Patented Sept. 6, 1859; additional improvement dated Nov. 15, 1859:

I claim combining a fire-place and flues, or their equivalent heating-apparatus, with the water-tank, L, for the purpose specified.

DESIGN.

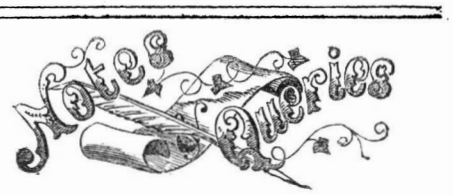
Harrison Grosh, of Litiz, Warwick Township, Pa., for a Design for Carriage-bodies.

NOTE.—During the past four weeks 106 patents were obtained through the Scientific American Patent Agency; this is more than one-third of the whole number of patents granted during that period.

Literary Notices.

THE ATLANTIC MONTHLY, for this month, appears under the control of Messrs. Ticknor & Fields, the well-known Boston publishers. It contains some very choice articles, and there can be no doubt that this monthly will take a still higher rank, under its new management, than it has yet attained.

THE WESTMINSTER REVIEW, for October, republished by Leonard Scott & Co., contains articles on the following subjects:—Militia Forces, Rosseau—his Life and Writings, Spiritual Freedom, Modern Poets and Poetry of Italy, Physical Geography of the Atlantic Ocean, Garribaldi and the Italian Volunteers, Tennyson's Idylls of the King, and Bonapartism in Italy, besides its notices of contemporary literature.



D. C., of N J.—We would refer you to the daily newspapers for the information you ask. They are full of calls for the services of industrious persons in occupations such as those you mention.

La Crosse, Wis.—Some unknown correspondent from this place sends us samples of an improved spring fish-hook, and wants our opinion. We shall be happy to correspond with him, if he will furnish us with his name.

H. A., of Ohio.—The diluted oil to which you refer cannot be so durable to mix with paint as pure oil. The most durable known vehicle for paint exposed to the atmosphere is pure linseed oil. If there is anything superior to this it is unknown to us.

S. W. C., of N. Y.—The Ericsson air-engine is made in this city, and for purposes where but a trifling power is required answers quite as well as the steam-engine. No successful attempt has been made to overcome what you call the "dead point" in the crank engine. We should probably differ with you on this much vexed question.

W. D., of Kansas.—The double-piston slide valve is an old contrivance. We have seen one in operation as far back as 1845. Your mode of varying the stroke under the control of the governor has been applied to ordinary slide valves, and its application to the piston valve is not patentable.

A. G., of Saverne, France.—We are unable to furnish you with the designs and descriptions of the machinery mentioned in your letter. If you should visit this country the company would allow you to inspect their works in detail. We are entirely out of No. 39, Vol. XIV, SCIENTIFIC AMERICAN.

F R. P., of Fla.—If a man invents a new latch, and places it upon his front gate so that passers by may examine it, that would be a public use though only one person saw it. Avoidance of exposure to the public is evidence of private use. The ground which may be covered by a patent depends on circumstances. Your inquiries are not very clear.

E. S. V. O., of Miss.—The time required for a body to fall through any hight is equal, in seconds, to the square root of the quotient obtained by dividing twice the hight, in feet, by 32 1-6. Consequently, it will take about 8 seconds for a ball to fall 400 yards. Multiply 32 1-6 by 8, and you have the velocity of a falling body at the end of 8 seconds, that is 257 1-3 feet. This is more than a quarter the velocity with which a cannon ball sometimes moves, and would doubtless penetrate a man's head or break his skull. The resistance of the air would diminish the velocity a little from that here stated.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Nov. 19, 1859:—

W. E. W., of Tenn., $55; H. B. J., of N. J., $30; G. & R., of Mass., $25; L. G., of N. Y., $25; A. N., of N. H., $30; N. P., of N. Y., $30. S. W. R., of Mich., $30; B. & C., of N. Y., $30; W. C., of Iowa, $55; T. C. R., of Wis., $30; S. W., of Ga., $30; A. T. U., of N. Y., $30; J. V. T., of Ill., $30; E. M., of N. Y., $20; L. S. C., of N. Y., $114; D. W. C., of N. Y., $25; W. H. S., of R. I., $55; W. S., of Va., $25; A. B., of Wis., $30; S. B. & Son, of Mo., $30; D. N., of N. Y., $67; W. M., of N. Y., $30; J. G., of La., $25; C. F., of Conn., $100; N. D., of N. J., $35; J. B. S., of Pa., $32; C. & S., of Mass., $30; G. W. R., of N. Y., $55; S. W. C., of Mich., $25; E. P. M., of N. Y., $50; A. L., of Ga. $70; M. K., of N. Y., $30. S. & R., of N. Y., $65; E. B., of N. Y., $55; N. H., of N. Y., $25; T. H. B., of N. Y., $30; E. A. L., of Ill., $30; J. J. McC., of N. J., $20; S. A. C., of Ill., $35; C. C. B., of Ohio, $25; C. B. R., of Conn., $30; E. B. C., of Fla., $25; J. K. L., of Ohio, $30; E. L., of N. Y., $35; J. S. L., of Pa., $25; I. H., of N. Y., $30; A. A. W., of N. Y., $30; T. S. W., of N. Y., $30; T. H. B., of N. Y., $30; D. H., of N. Y., $55.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 19, 1859:—

W. S., of Va.; J. G., of La.; A. J. G., of Oregon; N. L., of Conn.; J. W. S., of D. C.; S. W. C., of Mich.; J. H. G., of Cal.; E. B., of N. Y.; N. H., of N. Y.; A. B. F., of Ohio; L. G., of N. Y.; G. W. M., of Tenn.; E. B. C., of Fla.; A. W., of N. Y.; J. B. S., of Pa.; W. H. S., of R. I.; L. S. C., of N. Y.; L. O. C., of N. Y.; J. H. G., of Cal.; G. W. S., of Conn.; C. C. B., of Ohio; N. D., of N. J.; A. L., of Ga. (two cases); T. S. W., of N. Y.; D. H., of N. Y.; S. & R., of N. Y.; F. S. M., of N. Y.; H. B. F., of N. Y.; O. S., of N. Y; W. E. W., of Tenn.

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Munn & Co.,
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Auf der Office wird deutsch gesprochen.

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IMPROVEMENT IN HEMMING-GUIDES FOR SEWING-MACHINES.

We present herewith illustrations of a new invention in sewing-machines, being a device for holding and guiding the edge of the cloth for hemming. We copy the inventors' description, with their own statement of the advantages of this attachment:—

Fig. 1

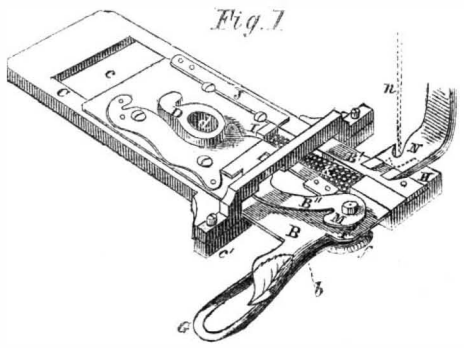
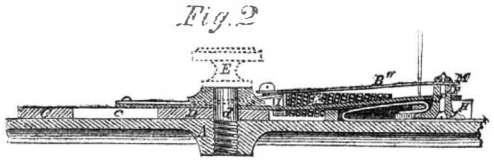


Fig. 2



A represents the plate of a sewing-machine. B B′ is the guide-frame, consisting chiefly of a thin plate of spring steel, partially divided by a longitudinal gap or interval. C is a stiff metallic plated form, called the "gage," and provided with a square flange or shoulder, *c′*. The gage, C, is restricted to a rectilinear adjustment beneath the frame, B B′, by a boss, D, on the bottom of the frame, occupying a dovetailed longitudinal slot, *c*, in the gage.

A central aperture, *d*, in the boss, D, permits the insertion of a clamping-screw, E, which, fitting a screw-hole in the plate, A, serves the two-fold purpose of holding the guide to the plate and of clamping or fixing the gage to its point of adjustment. Each of the limbs, B and B′, constitutes a spring adapted to yield upward at its free end. An oblique slot in the limb, B, causes its flexibility to be chiefly in an oblique direction from the corner, *b″*, outward and forward. with respect to the hem, so as to facilitate the insertion of the "stuff" and the passage of the cross-seams and other irregularities. The flexibility of the limb, B′, is transverse to the hem. The free end of the limb, B, is surmounted by a supplemental spring, B″, from which depends, vertically, a a stud-shaft, *f′*, forming the axis of a conical roller, F, fluted longitudinally, and terminating below in a flange, *f*. From the top of the limb, B, projects also a tongue, G, of spring-steel, having its free extremity flattened and twisted in a right hand spiral form. This tongue is, for the first half of its length, directed backward, and is thence reflexed so that its extreme tip enters the space between the flange, *f*, of the roller, F, and the under side of the limb, B, against which latter it slightly presses.

The forms and relative adaptations of the yielding frame, B, spiral tongue, G, and flanged roller, F, facilitate the turning and folding of hems containing cross-seams and materials of various thicknesses. The limb, B′, has beneath its free end a boss or pad, H, smoothly grooved for the admission of the hem, and having a notch for the passage of the needle, *n*. K is a roller, occupying the central intervals of the frame and of the gage, running in journals, one of which is in the pad, H, and the other in a yielding block, I, which is united by a spring, J, to the frame, B B′. The limb, B′, is more rigid than the spring, J, in order that the pad, H, may tightly press the inner edge of the hem where the feed is applied, and in order that the roller, K, may derive its rotation chiefly from the advance of the inner edge of the hem; the outer end of the roller re-acting upon the hem and at its outer edge, so as to keep it flat and at its full width. The roller, K, by its capacity for yielding bodily upward or at either end, permits the easy and equal passage of the hem, notwithstanding any inequality of thickness or texture or irregularity of draft. To insure the efficiency of the roller, K, in preserving a flat hem or tuck of uniform breadth, we form on its surface a series of right-hand spiral ribs, indented with transverse nicks or grooves, as represented. For heavy work, a customary pressure-pad, N, may be used to assist the action of the pad, H, and roller, K.

Operation: the guide is placed in position, so that the thumb-screw, E, occupies the screw-hole in the plate, A, of the sewing-machine, and so that the notch in the pad, H, coincides with the path of the needle. The gage, C, is then adjusted so as to bring its shoulder, *c′*, to the required distance from the seam, when the whole is clamped fast by the screw, E. The end of the cloth is then folded a short distance and drawn into the guide; and the machine being set in motion, a very slight attention of the operator suffices to continue the fold.

A guide thus constructed acts to hold the fold flat, and to cause it to advance uniformly and equally without crimping or narrowing the hem; the yielding and spirally-fluted roller, K, acting to press the folded or outer edge of the hem forward and outward against the shoulder of the gage, and the yielding conical roller, F, easing the edge of the fold at that part of the scroll where it is subjected to the greatest pressure, and permitting the passage of seams and other irregularities, as before explained. For these reasons this guide is especially applicable to seams of unusual width, and of irregular thickness and texture.

The patent for this invention was granted to Solomon E. Blake and Thomas Johnston, Oct. 11, 1859. For further particulars, address S. E. Blake, manufacturer, Providence, R. I., or A. B. Elliott, general agent, Troy, N. Y.

IMPROVED CHIMNEY CAPS.

The accompanying engravings illustrate an original device for the cure of smoky chimnies, which from its structure promises to be entirely effectual, and which we are told has already received the stamp of success in a large sale in some sections of the country. It is extremly simple though made in different forms, two of which are illustrated; Fig, 1 and 2 representing one of the forms, and Fig. 3 and 4 the other; Figs. 1 and 3 being perspective views, and Figs. 2 and 4, vertical sections.

Fig. 1

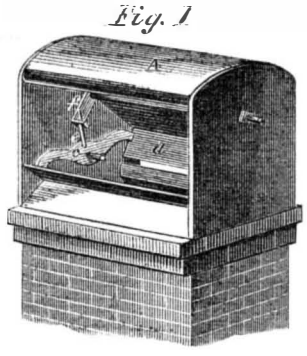


Fig. 2

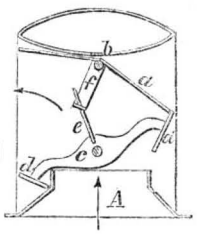


Fig. 3

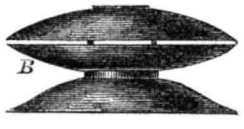
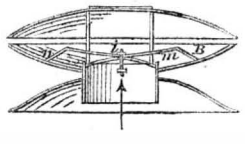


Fig. 4



A, is a metallic box, having the light, bent metal plate, *a*, suspended at its middle upon the pivot, *b*, below the plate, *a*, on two cross-bars, *c*, hung upon pivots at their middle and carrying the plates, *d d*, upon their ends. Stiff rods, *e*, are fastened to the cross-bars, and pass loosely through holes in the bent ends of the flat bars, *f*, which are rigedly attached to the upper plate, *a*. The parts are shown in the positions which they occupy when the wind is blowing from right to left, the face of the wind tilting the plates so as nearly to close the cap on the windward side, and open it widely on the leaward side. The upper plate is hung a very little above its center of gravity, and the lower plate a little below its center of gravity, and by varying the hight of these pivots the hanging of the plate may be so adjusted as to rest horizontally when the wind is at rest or when the wind comes against the end of the cap, but to turn when the slightest breeze comes in at either side.

The modification represented in Figs. 3 and 4 is intended for a cap for ventilating pipes, especially for cars and vessels, or anything in motion. In this, all the parts are stationary except the cup-shaped ring, B, which is hung upon the pivot, *i*, in the center of the cap, being supported by the bent rods, *n n*. It will be seen that in whatever direction the wind may blow against the cap, by its action on the under side of the ring it will tilt up the ring on that side.

The square cap is secured by two patents, one dated Nov. 23, 1858, and the other May 24, 1859. The round one was also patented May 24, 1859. The inventor is Charles Douglas, who has assigned half of the patent rights to Henry McCollom. The caps will be manufactured hereafter by McCollom & Douglas, to whom inquiries in relation to them may be addressed at Windham, Conn.

DISCOVERY OF A SUNKEN CITY.

A gentleman lately from Jamaica, *via* Boston, gives some curious particulars in regard to the discovery made in the harbor of Port Royal, in reference to the ancient city of that name. The discoveries were said to have been made by a party of divers but it was not stated who they were, or what they went for. It turns out, however, that they were sent from this country, to explore the wreck of the steamer *Osprey*, a small vessel of 800 tuns, that used to trade between New York and South America, calling into Kingston, Jamaica, a few years ago. The *Osprey*, in 1856, was on her return voyage, with a rich cargo of india-rubber, and other valuables, when she called as usual into Kingston. On the very morning of her intended departure, shortly after midnight she caught fire, through one or two of her crew attempting to steal spirits, and she burnt to the water's edge, and then sunk. The divers have been very successful in getting out of the hull of the vessel a large quantity of india-rubber, and other articles. While thus engaged, the steamer *Valorous* entered Port Royal, and something being the matter with her bottom, the American divers were employed to search. They did so, and discovered that a portion of the copper had been stripped off, which they made all right. Having done this they were encouraged to explore the ruins of the old city, now lying in several fathoms of water, which they did, and reported that they found the streets of the submerged city entire, as they had been laid out, with the ruins of buildings on each side. This is a matter worthy of antiquarian research (if such a term may be used, as it may, in the New World); and though the gold and silver there buried may never be discovered (and who shall say they will not?) it is really worth exploring the wreck of a place that was once—insignificant as it now is—one of the most ancient cities in America.—*N. Y. Express.*

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Publishers, No. 37 Park-row, New York.

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